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Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp
            195   200   205

Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu
    210   215   220

Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Ser Pro
225   230   235   240

Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
            245   250   255

Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
            260   265   270

Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
    275   280   285

Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
    290   295   300

Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe Pro Asn Ile Thr
305   310   315   320

Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser
            325   330   335

Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys Val Ala Asp Tyr
            340   345   350

Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly
        355   360   365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala
    370   375   380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly
385   390   395   400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe
            405   410   415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser
            420   425   430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu
        435   440   445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly
    450   455   460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp
465   470   475   480

Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val
            485   490   495

Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly
        500   505   510

Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn
    515   520   525

Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg
    530   535   540

Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp
545   550   555   560

Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys
            565   570   575

Ala Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser
            580   585   590

Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr
    595   600   605

Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr
610   615   620

Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu
625   630   635   640

His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly Ala Gly Ile
645   650   655

Cys Ala Ser Tyr His Thr Val Ser Leu Leu Arg Ser Thr Ser Gln Lys
660   665   670

Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Asp Ser Ser Ile Ala
675   680   685

Tyr Ser Asn Asn Thr Ile Ala Ile Pro Thr Asn Phe Ser Ile Ser Ile
690   695   700

Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ser Val Asp Cys
705   710   715   720

Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu
725   730   735

Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile
740   745   750

Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys
755   760   765

Gln Met Tyr Lys Thr Pro Thr Leu Lys Tyr Phe Gly Gly Phe Asn Phe
770   775   780

Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile
785   790   795   800

Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met
805   810   815

Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile
820   825   830

Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr
835   840   845

Asp Asp Met Ile Ala Ala Tyr Thr Ala Ala Leu Val Ser Gly Thr Ala

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                850   855   860

Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln Ile Pro Phe
865   870   875   880

Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn
                885   890   895

Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala
            900   905   910

Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly
            915   920   925

Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu
            930   935   940

Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn
945   950   955   960

Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp
                965   970   975

Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr Val Thr Gln
                980   985   990

Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn Leu Ala Ala
            995   1000   1005

Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg Val Asp
    1010   1015   1020

Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln Ala Ala
    1025   1030   1035

Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln
    1040   1045   1050

Glu Arg Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu Gly Lys
    1055   1060   1065

Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser
    1070   1075   1080

Trp Phe Ile Thr Gln Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr
    1085   1090   1095

Thr Asp Asn Thr Phe Val Ser Gly Asn Cys Asp Val Val Ile Gly
   1100   1105   1110

Ile Ile Asn Asn Thr Val Tyr Asp Pro Leu Gln Pro Glu Leu Asp
   1115   1120   1125

Ser Phe Lys Glu Glu Leu Asp Lys Tyr Phe Lys Asn His Thr Ser
   1130   1135   1140

Pro Asp Val Asp Leu Gly Asp Ile Ser Gly Ile Asn Ala Ser Val
   1145   1150   1155

Val Asn Ile Gln Lys Glu Ile Asp Arg Leu Asn Glu Val Ala Lys
   1160   1165   1170

Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr
   1175   1180   1185

Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile
   1190   1195   1200

Ala Gly Leu Ile Ala Ile Val Met Val Thr Ile Leu Leu Cys Cys
   1205   1210   1215

Met Thr Ser Cys Cys Ser Cys Leu Lys Gly Ala Cys Ser Cys Gly
   1220   1225   1230

Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val Leu Lys
   1235   1240   1245

Gly Val Lys Leu His Tyr Thr
   1250   1255

<210> 34
<211> 220
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 34

Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
1   5   10   15

Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met
       20   25   30

Leu Leu Gln Phe Ala Tyr Ser Asn Arg Asn Arg Phe Leu Tyr Ile Ile
       35   40   45

```
Lys Leu Val Phe Leu Trp Leu Leu Trp Pro Val Thr Leu Ala Cys Phe
    50              55              60
```

```
Val Leu Ala Ala Val Tyr Arg Ile Asn Trp Val Thr Gly Gly Ile Ala
65              70              75              80
```

```
Ile Ala Met Ala Cys Ile Val Gly Leu Met Trp Leu Ser Tyr Phe Val
            85              90              95
```

```
Ala Ser Phe Arg Leu Phe Ala Arg Thr Arg Ser Met Trp Ser Phe Asn
            100             105             110
```

```
Pro Glu Thr Asn Ile Leu Leu Asn Val Pro Leu Arg Gly Thr Ile Val
        115             120             125
```

```
Thr Arg Pro Leu Met Glu Ser Glu Leu Val Ile Gly Ala Val Ile Ile
    130             135             140
```

```
Arg Gly His Leu Arg Met Ala Gly His Ser Leu Gly Arg Cys Asp Ile
145             150             155             160
```

```
Lys Asp Leu Pro Lys Glu Ile Thr Val Ala Thr Ser Arg Thr Leu Ser
            165             170             175
```

```
Tyr Tyr Lys Leu Gly Ala Ser Gln Arg Val Gly Thr Asp Ser Gly Phe
            180             185             190
```

```
Ala Ala Tyr Asn Arg Tyr Arg Ile Gly Asn Tyr Lys Leu Asn Thr Asp
            195             200             205
```

```
His Ala Gly Ser Asn Asp Asn Ile Ala Leu Leu Val
    210             215             220
```

```
<210>  35
<211>  76
<212>  PRT
<213>  Severe acute respiratory syndrome virus
```

```
<400>  35
```

```
Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser
1               5               10              15
```

```
Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
            20              25              30
```

```
Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn
        35              40              45
```

Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn
50   55   60

Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val
65   70   75

<210> 36
<211> 422
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 36

Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro Arg Ile
1   5   10   15

Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn Gly Gly
             20   25   30

Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu Pro Asn
         35   40   45

Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu
     50   55   60

Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly
65   70   75   80

Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg
                 85   90   95

Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr
             100   105   110

Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala Asn Lys
         115   120   125

Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr Pro Lys
     130   135   140

Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr Val Leu
145   150   155   160

Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala Glu Gly
                 165   170   175

Ser Arg Gly Gly Ser Gln Ala Ser Ser Arg Ser Ser Ser Arg Ser Arg
             180   185   190

```
Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn Ser Pro
        195             200             205


Ala Arg Met Ala Ser Gly Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu
        210             215             220


Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln
225             230             235             240


Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser
            245             250             255


Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr
            260             265             270


Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly
        275             280             285


Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln
    290             295             300


Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg
305             310             315             320


Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly
            325             330             335


Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile
        340             345             350


Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu
        355             360             365


Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro
    370             375             380


Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp
385             390             395             400


Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser
            405             410             415


Ala Asp Ser Thr Gln Ala
            420
```

<210> 37
<211> 230
<212> PRT

<213> Bovine coronavirus

<400> 37

```
Met Ser Ser Val Thr Thr Pro Ala Pro Val Tyr Thr Trp Thr Ala Asp
1               5               10              15

Glu Ala Ile Lys Phe Leu Lys Glu Trp Asn Phe Ser Leu Gly Ile Ile
            20              25              30

Leu Leu Phe Ile Thr Val Ile Leu Gln Phe Gly Tyr Thr Ser Arg Ser
        35              40              45

Met Phe Val Tyr Val Ile Lys Met Val Ile Leu Trp Leu Met Trp Pro
    50              55              60

Leu Thr Ile Ile Leu Thr Ile Phe Asn Cys Val Tyr Ala Leu Asn Asn
65              70              75              80

Val Tyr Leu Gly Phe Ser Ile Val Phe Thr Ile Val Ala Ile Ile Met
            85              90              95

Trp Ile Val Tyr Phe Val Asn Ser Ile Arg Leu Phe Ile Arg Thr Gly
            100             105             110

Ser Trp Trp Ser Phe Asn Pro Glu Thr Asn Asn Leu Met Cys Ile Asp
        115             120             125

Met Lys Gly Arg Met Tyr Val Arg Pro Ile Ile Glu Asp Tyr His Thr
    130             135             140

Leu Thr Val Thr Ile Ile Arg Gly His Leu Tyr Met Gln Gly Ile Lys
145             150             155             160

Leu Gly Thr Gly Tyr Ser Leu Ser Asp Leu Pro Ala Tyr Val Thr Val
            165             170             175

Ala Lys Val Ser His Leu Leu Thr Tyr Lys Arg Gly Phe Leu Asp Lys
            180             185             190

Ile Gly Asp Thr Ser Gly Phe Ala Val Tyr Val Lys Ser Lys Val Gly
        195             200             205

Asn Tyr Arg Leu Pro Ser Thr Gln Lys Gly Ser Gly Leu Asp Thr Ala
    210             215             220

Leu Leu Arg Asn Asn Ile
225             230
```

<210> 38
<211> 226
<212> PRT
<213> Avian infectious bronchitis virus

<400> 38

```
Met Ser Asn Gly Thr Glu Asn Cys Thr Leu Ser Thr Gln Gln Ala Ala
1               5                   10                  15

Glu Leu Phe Lys Glu Tyr Asn Leu Phe Ile Thr Ala Phe Leu Leu Phe
                20                  25                  30

Leu Thr Ile Leu Leu Gln Tyr Gly Tyr Ala Thr Arg Ser Arg Phe Ile
            35                  40                  45

Tyr Ile Leu Lys Met Ile Val Leu Trp Cys Phe Trp Pro Leu Asn Ile
        50                  55                  60

Ala Val Gly Ile Ile Ser Cys Ile Tyr Pro Pro Asn Thr Gly Gly Leu
65                  70                  75                  80

Val Ala Ala Ile Ile Leu Thr Val Phe Ala Cys Leu Ser Phe Val Gly
                85                  90                  95

Tyr Trp Ile Gln Ser Phe Arg Leu Phe Lys Arg Cys Arg Ser Trp Trp
                100                 105                 110

Ser Phe Asn Pro Glu Ser Asn Ala Val Gly Ser Ile Leu Leu Thr Asn
            115                 120                 125

Gly Gln Gln Cys Asn Phe Ala Ile Glu Ser Val Pro Met Val Leu Ser
        130                 135                 140

Pro Ile Ile Lys Asn Gly Ala Leu Tyr Cys Glu Gly Gln Trp Leu Ala
145                 150                 155                 160

Lys Cys Glu Pro Asp His Leu Pro Lys Asp Ile Phe Val Cys Thr Pro
                165                 170                 175

Asp Arg Arg Asn Ile Tyr Arg Met Val Gln Lys Tyr Thr Gly Asp Gln
            180                 185                 190

Ser Gly Asn Lys Lys Arg Phe Ala Thr Phe Val Tyr Ala Lys Gln Ser
            195                 200                 205

Val Asp Thr Gly Glu Leu Gly Ser Val Ala Thr Gly Gly Ser Ser Leu
210                 215                 220
```

Tyr Thr
225

<210> 39
<211> 262
<212> PRT
<213> Transmissible gastroenteritis virus

<400> 39

Met Lys Ile Leu Leu Ile Leu Ala Cys Val Ile Ala Cys Ala Cys Gly
1   5   10   15

Glu Arg Tyr Cys Ala Met Lys Ser Asp Thr Asp Leu Ser Cys Arg Asn
            20   25   30

Ser Thr Ala Ser Asp Cys Glu Ser Cys Phe Asn Gly Gly Asp Leu Ile
            35   40   45

Trp His Leu Ala Asn Trp Asn Phe Ser Trp Ser Ile Ile Leu Ile Val
    50   55   60

Phe Ile Thr Val Leu Gln Tyr Gly Arg Pro Gln Phe Ser Trp Phe Val
65   70   75   80

Tyr Gly Ile Lys Met Leu Ile Met Trp Leu Leu Trp Pro Val Val Leu
                85   90   95

Ala Leu Thr Ile Phe Asn Ala Tyr Ser Glu Tyr Gln Val Ser Arg Tyr
            100   105   110

Val Met Phe Gly Phe Ser Ile Ala Gly Ala Ile Val Thr Phe Val Leu
        115   120   125

Trp Ile Met Tyr Phe Val Arg Ser Ile Gln Leu Tyr Arg Arg Thr Lys
    130   135   140

Ser Trp Trp Ser Phe Asn Pro Glu Thr Lys Ala Ile Leu Cys Val Ser
145   150   155   160

Ala Leu Gly Arg Ser Tyr Val Leu Pro Leu Glu Gly Val Pro Thr Gly
                165   170   175

Val Thr Leu Thr Leu Leu Ser Gly Asn Leu Tyr Ala Glu Gly Phe Lys
            180   185   190

Ile Ala Gly Gly Met Asn Ile Asp Asn Leu Pro Lys Tyr Val Met Val
            195   200   205

```
Ala Leu Pro Ser Arg Thr Ile Val Tyr Thr Leu Val Gly Lys Lys Leu
    210                 215             220

Lys Ala Ser Ser Ala Thr Gly Trp Ala Tyr Tyr Val Lys Ser Lys Ala
225                 230             235                 240

Gly Asp Tyr Ser Thr Glu Ala Arg Thr Asp Asn Leu Ser Glu Gln Glu
                245             250                 255

Lys Leu Leu His Met Val
            260
```

```
<210>  40
<211>  263
<212>  PRT
<213>  feline coronavirus

<400>  40
```

```
Met Lys Ile Leu Leu Ile Leu Ala Cys Ala Val Ala Cys Val Tyr Gly
1               5               10              15

Glu Gln Ile Arg Tyr Cys Ala Met Gln Glu Thr Gly Leu Ser Cys Arg
            20              25              30

Asn Gly Thr Ala Ser Asp Cys Glu Ser Cys Phe Asn Gly Gly Asp Leu
        35              40              45

Ile Trp His Leu Ala Asn Trp Asn Phe Ser Trp Ser Ile Ile Leu Ile
    50              55              60

Val Phe Ile Thr Val Leu Gln Tyr Gly Arg Pro Gln Phe Ser Trp Phe
65              70              75              80

Val Tyr Gly Ile Lys Met Leu Ile Met Trp Leu Leu Trp Pro Ile Val
            85              90              95

Leu Ala Leu Thr Ile Phe Asn Ala Tyr Ser Glu Tyr Glu Val Ser Arg
            100             105             110

Tyr Val Met Phe Gly Phe Ser Val Ala Gly Ala Val Val Thr Phe Ala
        115             120             125

Leu Trp Met Met Tyr Phe Val Arg Ser Ile Gln Leu Tyr Arg Arg Thr
    130             135             140

Lys Ser Trp Trp Ser Phe Asn Pro Glu Thr Asn Ala Ile Leu Cys Val
145             150             155             160
```

```
Asn Ala Leu Gly Arg Ser Tyr Val Leu Pro Leu Asp Gly Thr Pro Thr
            165             170             175

Gly Val Thr Leu Thr Leu Leu Ser Gly Asn Leu Tyr Ala Glu Gly Phe
            180             185             190

Lys Met Ala Gly Gly Leu Thr Ile Glu His Leu Pro Lys Tyr Val Met
            195             200             205

Ile Arg Thr Pro Asn Arg Thr Ile Val Tyr Thr Leu Val Gly Lys Gln
    210             215             220

Leu Lys Ala Thr Thr Ala Thr Gly Trp Ala Tyr Tyr Val Lys Ser Lys
225             230             235             240

Ala Gly Asp Tyr Ser Thr Glu Ala Arg Thr Asp Asn Leu Ser Glu His
            245             250             255

Glu Lys Leu Leu His Met Val
            260
```

```
<210>  41
<211>  231
<212>  PRT
<213>  Human coronavirus OC43
MSSKTTPAPVYIWTADEAIKFLKEWNFSLGIILLFITIILQFGYTSRSMFVYVIKMIILWLMWPLTIILTIFNCVYALNNVYLG
LSIVFTIVAIIMWIVYFVNSIRLFIRTGSFWSFNPETNNLMCIDMKGTMYVRPIIEDYHTLTVTIIRGHLYIQGIKLGTGYSWA
DLPAYMTVAKVTHLCTYKRGFLDRISDTSGFAVYVKSKVGNYRLPSTQKGSGMDTALLRNNI
```

<SEQ ID NO:37;prt;Porcine hemagglutinating encephalomyelitis virus

```
<400>  41

Met Ser Ser Pro Thr Thr Pro Val Pro Val Ile Ser Trp Thr Ala Asp
1               5               10              15

Glu Ala Ile Lys Phe Leu Lys Glu Trp Asn Phe Ser Leu Gly Ile Ile
            20              25              30

Val Leu Phe Ile Thr Ile Ile Leu Gln Phe Gly Tyr Thr Ser Arg Ser
        35              40              45

Met Phe Val Tyr Val Ile Lys Met Val Ile Leu Trp Leu Met Trp Pro
        50              55              60

Leu Thr Ile Ile Leu Thr Ile Phe Asn Cys Val Tyr Ala Leu Asn Asn
65              70              75              80

Val Tyr Leu Gly Phe Ser Ile Val Phe Thr Ile Val Ala Ile Ile Met
            85              90              95
```

```
Trp Val Val Tyr Phe Val Asn Ser Ile Arg Leu Phe Ile Arg Thr Gly
        100             105             110

Ser Trp Trp Ser Phe Asn Pro Glu Thr Asn Asn Leu Met Cys Ile Asp
        115             120             125

Met Lys Gly Arg Met Tyr Val Arg Pro Ile Ile Glu Asp Tyr His Thr
        130             135             140

Leu Thr Ala Thr Ile Ile Arg Gly His Leu Tyr Ile Gln Gly Ile Lys
145             150             155             160

Leu Gly Thr Gly Tyr Ser Leu Ser Asp Leu Pro Ala Tyr Val Thr Val
            165             170             175

Ala Lys Val Thr His Leu Cys Thr Tyr Lys Arg Gly Phe Leu Asp Arg
        180             185             190

Ile Gly Asp Thr Ser Gly Phe Ala Val Tyr Val Lys Ser Lys Val Gly
        195             200             205

Asn Tyr Arg Leu Pro Ser Thr His Lys Gly Ser Gly Met Asp Thr Ala
    210             215             220

Leu Leu Arg Asn Asn Ile Met
225             230
```

<210> 42
<211> 223
<212> PRT
<213> Avian infectious bronchitis virus

<400> 42

```
Met Met Glu Asn Cys Thr Leu Asn Leu Glu Gln Ala Thr Leu Leu Phe
1           5               10              15

Lys Glu Tyr Asn Leu Phe Ile Thr Ala Phe Leu Leu Phe Leu Thr Ile
            20              25              30

Leu Leu Gln Tyr Gly Tyr Ala Thr Arg Ser Arg Phe Ile Tyr Ile Leu
        35              40              45

Lys Met Ile Val Leu Trp Cys Phe Trp Pro Leu Asn Ile Ala Val Gly
    50              55              60

Val Ile Ser Cys Ile Tyr Pro Pro Asn Thr Gly Gly Leu Val Ala Ala
65              70              75              80
```

```
Ile Ile Leu Thr Val Phe Ala Cys Leu Ser Phe Val Gly Tyr Trp Ile
            85                  90                  95

Gln Ser Cys Arg Leu Phe Lys Arg Cys Arg Ser Trp Trp Ser Phe Asn
            100                 105                 110

Pro Glu Ser Asn Ala Val Gly Ser Ile Leu Leu Thr Asn Gly Gln Gln
            115                 120                 125

Cys Asn Phe Ala Ile Glu Ser Val Pro Met Val Leu Ala Pro Ile Ile
    130                 135                 140

Lys Asn Gly Val Leu Tyr Cys Glu Gly Gln Trp Leu Ala Lys Cys Glu
145                 150                 155                 160

Pro Asp His Leu Pro Lys Asp Ile Phe Val Cys Thr Pro Asp Arg Arg
                165                 170                 175

Asn Ile Tyr Arg Met Val Gln Lys Tyr Thr Gly Asp Gln Ser Gly Asn
                180                 185                 190

Lys Lys Arg Val Ala Thr Phe Val Tyr Ala Lys Gln Ser Val Asp Thr
            195                 200                 205

Gly Glu Leu Glu Ser Val Pro Thr Gly Gly Ser Ser Leu Tyr Thr
    210                 215                 220
```

<210> 43
<211> 455
<212> PRT
<213> Mouse Hepatitis Virus

<400> 43

```
Met Ser Phe Val Pro Gly Gln Glu Asn Ala Gly Ser Arg Ser Ser Ser
1               5                   10                  15

Val Asn Arg Ala Gly Asn Gly Ile Leu Lys Lys Thr Thr Trp Ala Asp
            20                  25                  30

Gln Thr Glu Arg Gly Pro Asn Asn Gln Asn Arg Gly Arg Arg Asn Gln
        35                  40                  45

Pro Lys Gln Thr Ala Thr Thr Gln Pro Asn Ser Gly Ser Val Val Pro
    50                  55                  60

His Tyr Ser Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu
65                  70                  75                  80
```

```
Phe Gln Phe Ala Gln Gly Gln Gly Val Pro Ile Ala Asn Gly Ile Pro
             85                  90                  95

Ala Ser Glu Gln Lys Gly Tyr Trp Tyr Arg His Asn Arg Arg Ser Phe
            100                 105                 110

Lys Thr Pro Asp Gly Gln Gln Lys Gln Leu Leu Pro Arg Trp Tyr Phe
            115                 120                 125

Tyr Tyr Leu Gly Thr Gly Pro His Ala Gly Ala Glu Tyr Gly Asp Asp
    130                 135                 140

Ile Asp Gly Val Val Trp Val Ala Ser Gln Gln Ala Asp Thr Lys Thr
145                 150                 155                 160

Thr Ala Asp Ile Val Glu Arg Asp Pro Ser Ser His Glu Ala Ile Pro
            165                 170                 175

Thr Arg Phe Ala Pro Gly Thr Val Leu Pro Gln Gly Phe Tyr Val Glu
            180                 185                 190

Gly Ser Gly Arg Ser Ala Pro Ala Ser Arg Ser Gly Ser Arg Ser Gln
        195                 200                 205

Ser Arg Gly Pro Asn Asn Arg Ala Arg Ser Ser Ser Asn Gln Arg Gln
    210                 215                 220

Pro Ala Ser Thr Val Lys Pro Asp Met Ala Glu Glu Ile Ala Ala Leu
225                 230                 235                 240

Val Leu Ala Lys Leu Gly Lys Asp Ala Gly Gln Pro Lys Gln Val Thr
            245                 250                 255

Lys Gln Ser Ala Lys Glu Val Arg Gln Lys Ile Leu Asn Lys Pro Arg
            260                 265                 270

Gln Lys Arg Thr Pro Asn Lys Gln Cys Pro Val Gln Gln Cys Phe Gly
        275                 280                 285

Lys Arg Gly Pro Asn Gln Asn Phe Gly Gly Ser Glu Met Leu Lys Leu
    290                 295                 300

Gly Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr
305                 310                 315                 320

Pro Ser Ala Phe Phe Phe Gly Ser Lys Leu Glu Leu Val Lys Lys Asn
```

Ser Gly Gly Ala Asp Asp Pro Thr Lys Asp Val Tyr Glu Leu Gln Tyr
          340   345   350

Ser Gly Ala Ile Arg Phe Asp Ser Thr Leu Pro Gly Phe Glu Thr Ile
          355   360   365

Met Lys Val Leu Asn Glu Asn Leu Asp Ala Tyr Gln Asp Gln Ala Gly
     370   375   380

Gly Ala Asp Val Val Ser Pro Lys Pro Gln Arg Lys Arg Gly Thr Lys
385   390   395   400

Gln Lys Ala Leu Lys Gly Glu Val Asp Asn Val Ser Val Ala Lys Pro
          405   410   415

Lys Ser Ser Val Gln Arg Asn Val Ser Arg Glu Leu Thr Pro Glu Asp
          420   425   430

Arg Ser Leu Leu Ala Gln Ile Leu Asp Asp Gly Val Val Pro Asp Gly
          435   440   445

Leu Glu Asp Asp Ser Asn Val
     450   455

<210> 44
<211> 448
<212> PRT
<213> Bovine coronavirus

<400> 44

Met Ser Phe Thr Pro Gly Lys Gln Ser Ser Ser Arg Ala Ser Ser Gly
1   5   10   15

Asn Arg Ser Gly Asn Gly Ile Leu Lys Trp Ala Asp Gln Ser Asp Gln
          20   25   30

Ser Arg Asn Val Gln Thr Arg Gly Arg Arg Ala Gln Pro Lys Gln Thr
     35   40   45

Ala Thr Ser Gln Gln Pro Ser Gly Gly Asn Val Val Pro Tyr Tyr Ser
     50   55   60

Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Glu Phe
65   70   75   80

Ala Glu Gly Gln Gly Val Pro Ile Ala Pro Gly Val Pro Ala Thr Glu

Ala Lys Gly Tyr Trp Tyr Arg His Asn Arg Arg Ser Phe Lys Thr Ala
        100   105   110

Asp Gly Asn Gln Arg Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu
        115   120   125

Gly Thr Gly Pro His Ala Lys Asp Gln Tyr Gly Thr Asp Ile Asp Gly
        130   135   140

Val Tyr Trp Val Ala Ser Asn Gln Ala Asp Val Asn Thr Pro Ala Asp
145   150   155   160

Ile Leu Asp Arg Asp Pro Ser Ser Asp Glu Ala Ile Pro Thr Arg Phe
            165   170   175

Pro Pro Gly Thr Val Leu Pro Gln Gly Tyr Tyr Ile Glu Gly Ser Gly
        180   185   190

Arg Ser Ala Pro Asn Ser Arg Ser Thr Ser Arg Ala Ser Ser Arg Ala
        195   200   205

Ser Ser Ala Gly Ser Arg Ser Arg Ala Asn Ser Gly Asn Arg Thr Pro
    210   215   220

Thr Ser Gly Val Thr Pro Asp Met Ala Asp Gln Ile Ala Ser Leu Val
225   230   235   240

Leu Ala Lys Leu Gly Lys Asp Ala Ala Lys Pro Gln Gln Val Thr Lys
            245   250   255

Gln Thr Ala Lys Glu Ile Arg Gln Lys Ile Leu Asn Lys Pro Arg Gln
        260   265   270

Lys Arg Ser Pro Asn Lys Gln Cys Thr Val Gln Gln Cys Phe Gly Lys
        275   280   285

Arg Gly Pro Asn Gln Asn Phe Gly Gly Gly Glu Met Leu Lys Leu Gly
    290   295   300

Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Ala
305   310   315   320

Gly Ala Phe Phe Phe Gly Ser Arg Leu Glu Leu Ala Lys Val Gln Asn
            325   330   335

```
Leu Ser Gly Asn Leu Asp Glu Pro Gln Lys Asp Val Tyr Glu Leu Arg
        340                 345                 350


Tyr Asn Gly Ala Ile Arg Phe Asp Ser Thr Leu Ser Gly Phe Glu Thr
        355                 360                 365


Ile Met Lys Val Leu Asn Glu Asn Leu Asn Ala Tyr Gln Gln Gln Asp
    370                 375                 380


Gly Thr Met Asn Met Ser Pro Lys Pro Gln Arg Gln Arg Gly Gln Lys
385                 390                 395                 400


Asn Gly Gln Gly Glu Asn Asp Asn Ile Ser Val Ala Ala Pro Lys Ser
            405                 410                 415


Arg Val Gln Gln Asn Lys Ile Arg Glu Leu Thr Ala Glu Asp Ile Ser
        420                 425                 430


Leu Leu Lys Lys Met Asp Glu Pro Phe Thr Glu Asp Thr Ser Glu Ile
        435                 440                 445
```

<210> 45
<211> 409
<212> PRT
<213> Avian infectious bronchitis virus

<400> 45

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Met Ala Ser Gly Lys Ala Ala Gly Lys Thr Asp Ala Pro Ala Pro Val
1               5                   10                  15


Ile Lys Leu Gly Gly Pro Lys Pro Pro Lys Val Gly Ser Ser Gly Asn
            20                  25                  30


Ala Ser Trp Phe Gln Ala Leu Lys Ala Lys Lys Leu Asn Ala Pro Ala
        35                  40                  45


Pro Lys Phe Glu Gly Ser Gly Val Pro Asp Asn Glu Asn Leu Lys Ile
    50                  55                  60


Ser Gln Gln His Gly Tyr Trp Arg Arg Gln Ala Arg Tyr Lys Pro Gly
65                  70                  75                  80


Lys Gly Gly Arg Lys Pro Val Pro Asp Ala Trp Tyr Phe Tyr Tyr Thr
            85                  90                  95


Gly Thr Gly Pro Ala Ala Asp Leu Asn Trp Gly Asp Ser Gln Asp Gly
        100                 105                 110
```

Ile Val Trp Val Ala Ala Lys Gly Ala Asp Val Lys Ser Arg Ser Asn
      115   120   125

Gln Gly Thr Arg Asp Pro Asp Lys Phe Asp Gln Tyr Pro Leu Arg Phe
      130   135   140

Ser Asp Gly Gly Pro Asp Gly Asn Phe Arg Trp Asp Phe Ile Pro Leu
145   150   155   160

Asn Arg Gly Arg Ser Gly Arg Ser Thr Ala Ala Ser Ser Ala Ala Ser
             165   170   175

Ser Arg Ala Pro Ser Arg Glu Gly Ser Arg Gly Arg Leu Asn Gly Ala
             180   185   190

Glu Asp Asp Leu Ile Ala Arg Ala Ala Lys Ile Ile Gln Asp Gln Gln
             195   200   205

Lys Lys Gly Ser Arg Ile Thr Lys Ala Lys Ala Glu Glu Met Ile His
      210   215   220

Arg Arg Tyr Cys Lys Arg Thr Val Pro Pro Gly Val Ser Ile Asp Lys
225   230   235   240

Val Phe Gly Pro Arg Thr Lys Gly Lys Glu Gly Asn Phe Gly Asp Asp
             245   250   255

Lys Met Asn Glu Glu Gly Ile Lys Asp Gly Arg Val Thr Ala Met Leu
             260   265   270

Asn Leu Val Pro Ser Ser His Ala Cys Leu Phe Gly Ser Gln Val Thr
             275   280   285

Pro Lys Leu Gln Pro Asp Gly Leu His Leu Thr Phe Arg Phe Thr Thr
      290   295   300

Val Val Ser Arg Asp Asp Pro Gln Phe Asp Asn Tyr Val Lys Ile Cys
305   310   315   320

Asp Glu Cys Val Asp Gly Val Gly Thr Arg Pro Lys Asp Glu Val Val
             325   330   335

Arg Pro Lys Ser Arg Ser Ser Ser Arg Pro Ala Thr Arg Gly Thr Ser
             340   345   350

Pro Ala Pro Lys Gln Gln Arg Pro Lys Lys Glu Lys Lys Pro Lys Lys
      355   360   365

```
Gln Asp Asp Glu Val Asp Lys Ala Leu Thr Ser Asp Glu Glu Arg Asn
    370             375             380

Asn Ala Gln Leu Glu Phe Asp Asp Glu Pro Lys Val Ile Asn Trp Gly
385             390             395             400

Asp Ser Ala Leu Gly Glu Asn Glu Leu
                405
```

```
<210>  46
<211>  376
<212>  PRT
<213>  Feline coronavirus

<400>  46
```

```
Met Ala Thr Gln Gly Gln Arg Val Asn Trp Gly Asp Glu Pro Ser Lys
1               5               10              15

Arg Arg Gly Arg Ser Asn Ser Arg Gly Arg Lys Asn Asn Asp Ile Pro
            20              25              30

Leu Ser Tyr Phe Asn Pro Ile Thr Leu Asp Gln Gly Ser Lys Phe Trp
        35              40              45

Asn Leu Cys Pro Arg Asp Phe Val Pro Lys Gly Ile Gly Asn Lys Asp
    50              55              60

Gln Gln Ile Gly Tyr Trp Asn Arg Gln Ala Arg Tyr Arg Ile Val Lys
65              70              75              80

Gly Gln Arg Val Glu Leu Pro Glu Arg Trp Phe Phe Tyr Phe Leu Gly
            85              90              95

Thr Gly Pro His Ala Asp Ala Lys Phe Lys Ala Lys Ile Asp Gly Val
            100             105             110

Phe Trp Val Ala Arg Asp Gly Ala Met Asn Lys Pro Thr Ser Leu Gly
        115             120             125

Thr Arg Gly Thr Asn Asn Glu Ser Lys Pro Leu Lys Phe Asp Gly Lys
    130             135             140

Ile Pro Pro Gln Phe Gln Leu Glu Val Asn Arg Ser Arg Asn Asn Ser
145             150             155             160

Arg Ser Gly Ser Gln Ser Arg Ser Val Ser Arg Asn Arg Ser Gln Ser
            165             170             175
```

```
Arg Gly Arg Gln Gln Ser Asn Asn Gln Asn Thr Asn Val Glu Asp Thr
            180                 185                 190

Ile Val Ala Val Leu Gln Lys Leu Gly Val Thr Asp Lys Gln Arg Ser
            195                 200                 205

Arg Ser Lys Ser Gly Glu Arg Ser Gln Ser Lys Ser Arg Asp Thr Thr
    210                 215                 220

Pro Lys Asn Ala Asn Lys His Thr Trp Lys Lys Thr Ala Gly Lys Gly
225                 230                 235                 240

Asp Val Thr Asn Phe Tyr Gly Ala Arg Ser Ser Ser Ala Asn Phe Gly
            245                 250                 255

Asp Ser Asp Leu Val Ala Asn Gly Asn Ala Ala Lys Cys Tyr Pro Gln
            260                 265                 270

Ile Ala Glu Cys Val Pro Ser Val Ser Ser Ile Leu Phe Gly Ser Gln
            275                 280                 285

Trp Ser Ala Glu Glu Ala Gly Asp Gln Val Lys Val Thr Leu Thr His
    290                 295                 300

Asn Tyr Tyr Leu Pro Lys Asp Asp Ala Lys Thr Ser Gln Phe Leu Glu
305                 310                 315                 320

Gln Ile Asp Ala Tyr Lys Arg Pro Ser Glu Val Ala Lys Asp Gln Arg
            325                 330                 335

Gln Arg Lys Ser Arg Ser Lys Ser Ala Asp Lys Lys Pro Glu Glu Leu
            340                 345                 350

Ser Val Thr Leu Glu Ala Tyr Thr Asp Val Phe Asp Asp Thr Gln Val
    355                 360                 365

Glu Met Ile Asp Glu Val Thr Asn
    370             375
```

<210> 47
<211> 382
<212> PRT
<213> porcine transmissible gastroenteritis virus

<400> 47

```
Met Ala Asn Gln Gly Gln Arg Val Ser Trp Gly Asp Glu Ser Thr Lys
1               5                   10                  15
```

Thr Arg Gly Arg Ser Asn Ser Arg Gly Arg Lys Asn Asn Asn Ile Pro
        20   25   30

Leu Ser Phe Phe Asn Pro Ile Thr Leu Gln Gln Gly Ser Lys Phe Trp
        35   40   45

Asn Leu Cys Pro Arg Asp Phe Val Pro Lys Gly Ile Gly Asn Arg Asp
    50   55   60

Gln Gln Ile Gly Tyr Trp Asn Arg Gln Thr Arg Tyr Arg Met Val Lys
65   70   75   80

Gly Gln Arg Lys Glu Leu Pro Glu Arg Trp Phe Phe Tyr Tyr Leu Gly
            85   90   95

Thr Gly Pro His Ala Asp Ala Lys Phe Lys Asp Lys Leu Asp Gly Val
            100   105   110

Val Trp Val Ala Lys Asp Gly Ala Met Asn Lys Pro Thr Thr Leu Gly
        115   120   125

Ser Arg Gly Ala Asn Asn Glu Ser Lys Ala Leu Lys Phe Asp Gly Lys
    130   135   140

Val Pro Gly Glu Phe Gln Leu Glu Val Asn Gln Ser Arg Asp Asn Ser
145   150   155   160

Arg Leu Arg Ser Gln Ser Arg Ser Arg Ser Arg Asn Arg Ser Gln Ser
            165   170   175

Arg Gly Arg Gln Gln Ser Asn Asn Lys Lys Asp Asp Ser Val Glu Gln
            180   185   190

Ala Val Leu Ala Ala Leu Lys Lys Leu Gly Val Tyr Thr Glu Lys Gln
        195   200   205

Gln Gln Arg Ser Arg Ser Lys Ser Lys Glu Arg Ser Asn Ser Lys Ile
    210   215   220

Arg Asp Thr Thr Pro Lys Asn Glu Asn Lys His Thr Trp Lys Arg Thr
225   230   235   240

Ala Gly Lys Gly Asp Val Thr Arg Phe Tyr Gly Thr Arg Ser Asn Ser
            245   250   255

Ala Asn Phe Gly Asp Ser Asp Leu Val Ala Asn Gly Ser Ser Ala Lys
            260   265   270

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```
His Tyr Pro Gln Leu Ala Glu Cys Val Pro Ser Val Ser Ser Ile Leu
        275             280             285

Phe Gly Ser Tyr Trp Thr Ser Lys Glu Asp Gly Asp Gln Ile Glu Val
    290             295             300

Thr Phe Thr His Lys Tyr His Leu Pro Lys Asp Asp Pro Lys Thr Gly
305             310             315             320

Gln Phe Leu Gln Gln Ile Asn Ala Tyr Ala Arg Pro Ser Glu Val Ala
        325             330             335

Lys Glu Gln Arg Lys Arg Lys Ser Arg Ser Lys Ser Ala Glu Arg Ser
        340             345             350

Glu Gln Glu Val Val Pro Asp Ala Leu Ile Glu Asn Tyr Thr Asp Val
        355             360             365

Phe Asp Asp Thr Gln Val Glu Met Ile Asp Glu Val Thr Asn
    370             375             380
```

```
<210>  48
<211>  389
<212>  PRT
<213>  Human coronavirus 229E

<400>  48
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```
Met Ala Thr Val Lys Trp Ala Asp Ala Ser Glu Pro Gln Arg Gly Arg
1               5               10              15

Gln Gly Arg Ile Pro Tyr Ser Leu Tyr Ser Pro Leu Leu Val Asp Ser
            20              25              30

Glu Gln Pro Trp Lys Val Ile Pro Arg Asn Leu Val Pro Ile Asn Lys
        35              40              45

Lys Asp Lys Asn Lys Leu Ile Gly Tyr Trp Asn Val Gln Lys Arg Phe
    50              55              60

Arg Thr Arg Lys Gly Lys Arg Val Asp Leu Ser Pro Lys Leu His Phe
65              70              75              80

Tyr Tyr Leu Gly Thr Gly Pro His Lys Asp Ala Lys Phe Arg Glu Arg
            85              90              95

Val Glu Gly Val Val Trp Val Ala Val Asp Gly Ala Lys Thr Glu Pro
        100             105             110
```

Thr Gly Tyr Gly Val Arg Arg Lys Asn Ser Glu Pro Glu Ile Pro His
        115   120   125

Phe Asn Gln Lys Leu Pro Asn Gly Val Thr Val Val Glu Glu Pro Asp
    130   135   140

Ser Arg Ala Pro Ser Arg Ser Gln Ser Arg Ser Gln Ser Arg Gly Arg
145   150   155   160

Gly Glu Ser Lys Pro Gln Ser Arg Asn Pro Ser Ser Asp Arg Asn His
            165   170   175

Asn Ser Gln Asp Asp Ile Met Lys Ala Val Ala Ala Ala Leu Lys Ser
        180   185   190

Leu Gly Phe Asp Lys Pro Gln Glu Lys Asp Lys Lys Ser Ala Lys Thr
        195   200   205

Gly Thr Pro Lys Pro Ser Arg Asn Gln Ser Pro Ala Ser Ser Gln Thr
    210   215   220

Ser Ala Lys Ser Leu Ala Arg Ser Gln Ser Ser Glu Thr Lys Glu Gln
225   230   235   240

Lys His Glu Met Gln Lys Pro Arg Trp Lys Arg Gln Pro Asn Asp Asp
            245   250   255

Val Thr Ser Asn Val Thr Gln Cys Phe Gly Pro Arg Asp Leu Asp His
        260   265   270

Asn Phe Gly Ser Ala Gly Val Val Ala Asn Gly Val Lys Ala Lys Gly
        275   280   285

Tyr Pro Gln Phe Ala Glu Leu Val Pro Ser Thr Ala Ala Met Leu Phe
    290   295   300

Asp Ser His Ile Val Ser Lys Glu Ser Gly Asn Thr Val Val Leu Thr
305   310   315   320

Phe Thr Thr Arg Val Thr Val Pro Lys Asp His Pro His Leu Gly Lys
            325   330   335

Phe Leu Glu Glu Leu Asn Ala Phe Thr Arg Glu Met Gln Gln His Pro
        340   345   350

Leu Leu Asn Pro Ser Ala Leu Glu Phe Asn Pro Ser Gln Thr Ser Pro
                        Page 78

```
              355                   360                   365
```

Ala Thr Ala Glu Pro Val Arg Asp Glu Val Ser Ile Glu Thr Asp Ile
    370   375   380

Ile Asp Glu Val Asn
385

<210> 49
<211> 448
<212> PRT
<213> Human coronavirus

<400> 49

Met Ser Phe Thr Pro Gly Lys Gln Ser Ser Ser Arg Ala Ser Ser Gly
1   5   10   15

Asn Arg Ser Gly Asn Gly Ile Leu Lys Trp Ala Asp Gln Ser Asp Gln
                20   25   30

Val Arg Asn Val Gln Thr Arg Gly Arg Arg Ala Gln Pro Lys Gln Thr
            35   40   45

Ala Thr Ser Gln Gln Pro Ser Gly Gly Asn Val Val Pro Tyr Tyr Ser
        50   55   60

Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Glu Phe
65   70   75   80

Val Glu Gly Gln Gly Pro Pro Ile Ala Pro Gly Val Pro Ala Thr Glu
                85   90   95

Ala Lys Gly Tyr Trp Tyr Arg His Asn Arg Gly Ser Phe Lys Thr Ala
                100   105   110

Asp Gly Asn Gln Arg Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu
            115   120   125

Gly Thr Gly Pro His Ala Lys Asp Gln Tyr Gly Thr Asp Ile Asp Gly
        130   135   140

Val Tyr Trp Val Ala Ser Asn Gln Ala Asp Val Asn Thr Pro Ala Asp
145   150   155   160

Ile Val Asp Arg Asp Pro Ser Ser Asp Glu Ala Ile Pro Thr Arg Phe
                165   170   175

Pro Pro Gly Thr Val Leu Pro Gln Gly Tyr Tyr Ile Glu Gly Ser Gly
                            Page 79

```
                180                    185                    190

Arg Ser Ala Pro Asn Ser Arg Ser Thr Ser Arg Thr Ser Ser Arg Ala
        195                    200                    205

Ser Ser Ala Gly Ser Arg Ser Arg Ala Asn Ser Gly Asn Arg Thr Pro
        210                    215                    220

Thr Ser Gly Val Thr Pro Asp Met Ala Asp Gln Ile Ala Ser Leu Val
225                    230                    235                    240

Leu Ala Lys Leu Gly Lys Asp Ala Thr Lys Pro Gln Gln Val Thr Lys
                245                    250                    255

His Thr Ala Lys Glu Val Arg Gln Lys Ile Leu Asn Lys Pro Arg Gln
                260                    265                    270

Lys Arg Ser Pro Asn Lys Gln Cys Thr Val Gln Gln Cys Phe Gly Lys
        275                    280                    285

Arg Gly Pro Asn Gln Asn Phe Gly Gly Gly Glu Met Leu Lys Leu Gly
        290                    295                    300

Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Ala
305                    310                    315                    320

Gly Ala Phe Phe Phe Gly Ser Arg Leu Glu Leu Ala Lys Val Gln Asn
                325                    330                    335

Leu Ser Gly Asn Pro Asp Glu Pro Gln Lys Asp Val Tyr Glu Leu Arg
                340                    345                    350

Tyr Asn Gly Ala Ile Arg Phe Asp Ser Thr Leu Ser Gly Phe Glu Thr
                355                    360                    365

Ile Met Lys Val Leu Asn Glu Asn Leu Asn Ala Tyr Gln Gln Gln Asp
        370                    375                    380

Gly Met Met Asn Met Ser Pro Lys Pro Gln Arg Gln Arg Gly His Lys
385                    390                    395                    400

Asn Gly Gln Gly Glu Asn Asp Asn Ile Ser Val Ala Val Pro Lys Ser
        405                    410                    415

Arg Val Gln Gln Asn Lys Ser Arg Glu Leu Thr Ala Glu Asp Ile Ser
        420                    425                    430
```

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```
Leu Leu Lys Lys Met Asp Glu Pro Tyr Thr Glu Asp Thr Ser Glu Ile
        435             440             445
```

```
<210>  50
<211>  449
<212>  PRT
<213>  porcine hemagglutinating encephalomyelitis
```

```
<400>  50
```

```
Met Ser Phe Thr Pro Gly Lys Gln Ser Ser Ser Arg Ala Ser Ser Gly
1               5               10              15
```

```
Asn Arg Ser Gly Asn Gly Ile Leu Lys Trp Ala Asp Gln Ser Asp Gln
            20              25              30
```

```
Ser Arg Asn Val Gln Thr Arg Gly Arg Arg Val Gln Ser Lys Gln Thr
        35              40              45
```

```
Ala Thr Ser Gln Gln Pro Ser Gly Gly Thr Val Val Pro Tyr Tyr Ser
    50              55              60
```

```
Trp Phe Ser Gly Ile Thr Gln Phe Gln Lys Gly Lys Glu Phe Glu Phe
65              70              75              80
```

```
Ala Glu Gly Gln Gly Val Pro Ile Ala Pro Gly Val Pro Ser Thr Glu
            85              90              95
```

```
Ala Lys Gly Tyr Trp Tyr Arg His Asn Arg Arg Ser Phe Lys Thr Ala
            100             105             110
```

```
Asp Gly Asn Gln Arg Gln Leu Leu Pro Arg Trp Tyr Phe Tyr Tyr Leu
        115             120             125
```

```
Gly Thr Gly Pro His Ala Lys Asp Gln Tyr Gly Thr Asp Ile Asp Gly
    130             135             140
```

```
Val Phe Trp Val Ala Ser Asn Gln Ala Asp Ile Asn Thr Pro Ala Asp
145             150             155             160
```

```
Ile Val Asp Arg Asp Pro Ser Ser Asp Glu Ala Ile Pro Thr Arg Phe
            165             170             175
```

```
Pro Pro Gly Thr Val Leu Pro Gln Gly Tyr Tyr Ile Glu Gly Ser Gly
            180             185             190
```

```
Arg Ser Ala Pro Asn Ser Arg Ser Thr Ser Arg Ala Pro Asn Arg Ala
        195             200             205
```

Pro Ser Ala Gly Ser Arg Ser Arg Ala Asn Ser Gly Asn Arg Thr Ser
210   215   220

Thr Pro Gly Val Thr Pro Asp Met Ala Asp Gln Ile Ala Ser Leu Val
225   230   235   240

Leu Ala Lys Leu Gly Lys Asp Ala Thr Lys Pro Gln Gln Val Thr Lys
245   250   255

Gln Thr Ala Lys Glu Val Arg Gln Lys Ile Leu Asn Lys Pro Arg Gln
260   265   270

Lys Arg Ser Pro Asn Lys Gln Cys Thr Val Gln Gln Cys Phe Gly Lys
275   280   285

Arg Gly Pro Asn Gln Asn Phe Gly Gly Glu Met Leu Lys Leu Gly
290   295   300

Thr Ser Asp Pro Gln Phe Pro Ile Leu Ala Glu Leu Ala Pro Thr Ala
305   310   315   320

Gly Ala Phe Phe Phe Gly Ser Arg Leu Glu Leu Ala Lys Val Gln Asn
325   330   335

Leu Ser Gly Asn Pro Asp Glu Pro Gln Lys Asp Val Tyr Glu Leu Arg
340   345   350

Tyr Asn Gly Ala Ile Arg Phe Asp Ser Thr Leu Ser Gly Phe Glu Thr
355   360   365

Ile Met Lys Val Leu Asn Gln Asn Leu Asn Ala Tyr Gln His Gln Glu
370   375   380

Asp Gly Met Met Asn Ile Ser Pro Lys Pro Gln Arg Gln Arg Gly Gln
385   390   395   400

Lys Asn Gly Gln Val Glu Asn Asp Asn Val Ser Val Ala Ala Pro Lys
405   410   415

Ser Arg Val Gln Gln Asn Lys Ser Arg Glu Leu Thr Ala Glu Asp Ile
420   425   430

Ser Leu Leu Lys Lys Met Asp Glu Pro Tyr Thr Glu Asp Thr Ser Glu
435   440   445

Ile

<210> 51
<211> 409
<212> PRT
<213> turkey coronavirus

<400> 51

Met Ala Ser Gly Lys Ala Thr Gly Lys Thr Asp Ala Pro Ala Pro Ile
1   5   10   15

Ile Lys Leu Gly Gly Pro Lys Pro Pro Lys Val Gly Ser Ser Gly Asn
                20   25   30

Ala Ser Trp Phe Gln Ser Ile Lys Ala Lys Lys Leu Asn Ser Pro Gln
            35   40   45

Pro Lys Phe Glu Gly Ser Gly Val Pro Asp Asn Glu Asn Ile Lys Thr
        50   55   60

Ser Gln Gln His Gly Tyr Trp Arg Arg Gln Ala Arg Phe Lys Pro Gly
65   70   75   80

Lys Gly Gly Arg Lys Pro Val Pro Asp Ala Trp Tyr Phe Tyr Tyr Thr
                85   90   95

Gly Thr Gly Pro Ala Ala Asp Leu Asn Trp Gly Asp Thr Gln Asp Gly
            100   105   110

Ile Val Trp Val Ala Ala Lys Gly Ala Asp Val Lys Ser Arg Ser Asn
            115   120   125

Gln Gly Thr Arg Asp Pro Asp Lys Phe Asp Gln Tyr Pro Leu Arg Phe
    130   135   140

Ser Asp Gly Gly Pro Asp Ser Asn Phe Arg Trp Asp Phe Ile Pro Leu
145   150   155   160

His Arg Gly Arg Ser Gly Arg Ser Thr Ala Ala Ser Ser Ala Ala Ser
                165   170   175

Ser Arg Ala Pro Ser Arg Asp Gly Ser Arg Gly Arg Arg Ser Gly Ser
                180   185   190

Glu Asp Asp Leu Ile Ala Arg Ala Ala Lys Ile Ile Gln Asp Gln Gln
                195   200   205

Lys Lys Gly Ser Arg Ile Thr Lys Ala Lys Ala Asp Glu Met Ala His
    210   215   220

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Arg Arg Tyr Cys Lys Arg Thr Val Pro Pro Gly Tyr Lys Val Asp Gln
225   230   235   240

Val Phe Gly Pro Arg Thr Lys Gly Lys Glu Gly Asn Phe Gly Asp Asp
                245   250   255

Lys Met Asn Glu Glu Gly Ile Lys Asp Gly Arg Val Thr Ala Met Leu
            260   265   270

Asn Leu Val Pro Ser Ser His Ala Cys Leu Phe Gly Ser Arg Val Thr
            275   280   285

Pro Lys Leu Gln Pro Asp Gly Leu His Leu Arg Phe Glu Phe Thr Thr
    290   295   300

Val Val Pro Arg Asp Asp Pro Gln Phe Asp Asn Tyr Val Thr Ile Cys
305   310   315   320

Asp Gln Cys Val Asp Gly Ile Gly Thr Arg Pro Lys Asp Asn Glu Pro
            325   330   335

Arg Pro Lys Ser Arg Pro Ser Ser Arg Pro Ala Thr Arg Gly Asn Ser
            340   345   350

Pro Ala Pro Arg Gln Gln Arg Pro Lys Lys Glu Lys Lys Pro Lys Lys
            355   360   365

Gln Asp Asp Glu Val Asp Lys Ala Leu Thr Ser Asp Glu Glu Arg Asn
    370   375   380

Asn Ala Gln Leu Glu Phe Asp Asp Glu Pro Lys Val Ile Asn Trp Gly
385   390   395   400

Asp Ser Ala Leu Gly Glu Asn His Leu
                405

<210>   52
<211>   1173
<212>   PRT
<213>   Human coronavirus 229E

<400>   52

Met Phe Val Leu Leu Val Ala Tyr Ala Leu Leu His Ile Ala Gly Cys
1   5   10   15

Gln Thr Thr Asn Gly Leu Asn Thr Ser Tyr Ser Val Cys Asn Gly Cys
            20   25   30

Val Gly Tyr Ser Glu Asn Val Phe Ala Val Glu Ser Gly Gly Tyr Ile
        35   40   45

Pro Ser Asp Phe Ala Phe Asn Asn Trp Phe Leu Leu Thr Asn Thr Ser
    50   55   60

Ser Val Val Asp Gly Val Val Arg Ser Phe Gln Pro Leu Leu Leu Asn
65   70   75   80

Cys Leu Trp Ser Val Ser Gly Leu Arg Phe Thr Thr Gly Phe Val Tyr
            85   90   95

Phe Asn Gly Thr Gly Arg Gly Asp Cys Lys Gly Phe Ser Ser Asp Val
            100   105   110

Leu Ser Asp Val Ile Arg Tyr Asn Leu Asn Phe Glu Glu Asn Leu Arg
        115   120   125

Arg Gly Thr Ile Leu Phe Lys Thr Ser Tyr Gly Val Val Val Phe Tyr
    130   135   140

Cys Thr Asn Asn Thr Leu Val Ser Gly Asp Ala His Ile Pro Phe Gly
145   150   155   160

Thr Val Leu Gly Asn Phe Tyr Cys Phe Val Asn Thr Thr Ile Gly Thr
            165   170   175

Glu Thr Thr Ser Ala Phe Val Gly Ala Leu Pro Lys Thr Val Arg Glu
            180   185   190

Phe Val Ile Ser Arg Thr Gly His Phe Tyr Ile Asn Gly Tyr Arg Tyr
        195   200   205

Phe Thr Leu Gly Asn Val Glu Ala Val Asn Phe Asn Val Thr Thr Ala
    210   215   220

Glu Thr Thr Asp Phe Phe Thr Val Ala Leu Ala Ser Tyr Ala Asp Val
225   230   235   240

Leu Val Asn Val Ser Gln Thr Ser Ile Ala Asn Ile Ile Tyr Cys Asn
            245   250   255

Ser Val Ile Asn Arg Leu Arg Cys Asp Gln Leu Ser Phe Tyr Val Pro
            260   265   270

Asp Gly Phe Tyr Ser Thr Ser Pro Ile Gln Ser Val Glu Leu Pro Val
        275   280   285

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Ser Ile Val Ser Leu Pro Val Tyr His Lys His Met Phe Ile Val Leu
    290   295   300

Tyr Val Asp Phe Lys Pro Gln Ser Gly Gly Lys Cys Phe Asn Cys
305   310   315   320

Tyr Pro Ala Gly Val Asn Ile Thr Leu Ala Asn Phe Asn Glu Thr Lys
            325   330   335

Gly Pro Leu Cys Val Asp Thr Ser His Phe Thr Thr Lys Tyr Val Ala
            340   345   350

Val Tyr Ala Asn Val Gly Arg Trp Ser Ala Ser Ile Asn Thr Gly Asn
        355   360   365

Cys Pro Phe Ser Phe Gly Lys Val Asn Asn Phe Val Lys Phe Gly Ser
    370   375   380

Val Cys Phe Ser Leu Lys Asp Ile Pro Gly Gly Cys Ala Met Pro Ile
385   390   395   400

Val Ala Asn Trp Ala Tyr Ser Lys Tyr Tyr Thr Ile Gly Thr Leu Tyr
            405   410   415

Val Ser Trp Ser Asp Gly Asp Gly Ile Thr Gly Val Pro Gln Pro Val
            420   425   430

Glu Gly Val Ser Ser Phe Met Asn Val Thr Leu Asp Lys Cys Thr Lys
        435   440   445

Tyr Asn Ile Tyr Asp Val Ser Gly Val Gly Val Ile Arg Val Ser Asn
    450   455   460

Asp Thr Phe Leu Asn Gly Ile Thr Tyr Thr Ser Thr Ser Gly Asn Leu
465   470   475   480

Leu Gly Phe Lys Asp Val Thr Lys Gly Thr Ile Tyr Ser Ile Thr Pro
            485   490   495

Cys Asn Pro Pro Asp Gln Leu Val Val Tyr Gln Gln Ala Val Val Gly
            500   505   510

Ala Met Leu Ser Glu Asn Phe Thr Ser Tyr Gly Phe Ser Asn Val Val
            515   520   525

Glu Leu Pro Lys Phe Phe Tyr Ala Ser Asn Gly Thr Tyr Asn Cys Thr

530   535   540

Asp Ala Val Leu Thr Tyr Ser Ser Phe Gly Val Cys Ala Asp Gly Ser
545   550   555   560

Ile Ile Ala Val Gln Pro Arg Asn Val Ser Tyr Asp Ser Val Ser Ala
              565   570   575

Ile Val Thr Ala Asn Leu Ser Ile Pro Ser Asn Trp Thr Ile Ser Val
          580   585   590

Gln Val Glu Tyr Leu Gln Ile Thr Ser Thr Pro Ile Val Val Asp Cys
      595   600   605

Ser Thr Tyr Val Cys Asn Gly Asn Val Arg Cys Val Glu Leu Leu Lys
    610   615   620

Gln Tyr Thr Ser Ala Cys Lys Thr Ile Glu Asp Ala Leu Arg Asn Ser
625   630   635   640

Ala Arg Leu Glu Ser Ala Asp Val Ser Glu Met Leu Thr Phe Asp Lys
              645   650   655

Lys Ala Phe Thr Leu Ala Asn Val Ser Ser Phe Gly Asp Tyr Asn Leu
              660   665   670

Ser Ser Val Ile Pro Ser Leu Pro Thr Ser Gly Ser Arg Val Ala Gly
          675   680   685

Arg Ser Ala Ile Glu Asp Ile Leu Phe Ser Lys Ile Val Thr Ser Gly
    690   695   700

Leu Gly Thr Val Asp Ala Asp Tyr Lys Asn Cys Thr Lys Gly Leu Ser
705   710   715   720

Ile Ala Asp Leu Ala Cys Ala Gln Tyr Tyr Asn Gly Ile Met Val Leu
              725   730   735

Pro Gly Val Ala Asp Ala Glu Arg Met Ala Met Tyr Thr Gly Ser Leu
              740   745   750

Ile Gly Gly Ile Ala Leu Gly Gly Leu Thr Ser Ala Val Ser Ile Pro
          755   760   765

Phe Ser Leu Ala Ile Gln Ala Arg Leu Asn Tyr Val Ala Leu Gln Thr
770   775   780

Asp Val Leu Gln Glu Asn Gln Lys Ile Leu Ala Ala Ser Phe Asn Lys
785   790   795   800

Ala Met Thr Asn Ile Val Asp Ala Phe Thr Gly Val Asn Asp Ala Ile
          805   810   815

Thr Gln Thr Ser Gln Ala Leu Gln Thr Val Ala Thr Ala Leu Asn Lys
          820   825   830

Ile Gln Asp Val Val Asn Gln Gln Gly Asn Ser Leu Asn His Leu Thr
          835   840   845

Ser Gln Leu Arg Gln Asn Phe Gln Ala Ile Ser Ser Ser Ile Gln Ala
    850   855   860

Ile Tyr Asp Arg Leu Asp Thr Ile Gln Ala Asp Gln Gln Val Asp Arg
865   870   875   880

Leu Ile Thr Gly Arg Leu Ala Ala Leu Asn Val Phe Val Ser His Thr
          885   890   895

Leu Thr Lys Tyr Thr Glu Val Arg Ala Ser Arg Gln Leu Ala Gln Gln
          900   905   910

Lys Val Asn Glu Cys Val Lys Ser Gln Ser Lys Arg Tyr Gly Phe Cys
          915   920   925

Gly Asn Gly Thr His Ile Phe Ser Ile Val Asn Ala Ala Pro Glu Gly
    930   935   940

Leu Val Phe Leu His Thr Val Leu Leu Pro Thr Gln Tyr Lys Asp Val
945   950   955   960

Glu Ala Trp Ser Gly Leu Cys Val Asp Gly Thr Asn Gly Tyr Val Leu
          965   970   975

Arg Gln Pro Asn Leu Ala Leu Tyr Lys Glu Gly Asn Tyr Tyr Arg Ile
          980   985   990

Thr Ser Arg Ile Met Phe Glu Pro Arg Ile Pro Thr Met Ala Asp Phe
          995   1000   1005

Val Gln Ile Glu Asn Cys Asn Val Thr Phe Val Asn Ile Ser Arg
    1010   1015   1020

Ser Glu Leu Gln Thr Ile Val Pro Glu Tyr Ile Asp Val Asn Lys
    1025   1030   1035

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Thr Leu Gln Glu Leu Ser Tyr Lys Leu Pro Asn Tyr Thr Val Pro
    1040              1045          1050


Asp Leu Val Val Glu Gln Tyr Asn Gln Thr Ile Leu Asn Leu Thr
    1055              1060          1065


Ser Glu Ile Ser Thr Leu Glu Asn Lys Ser Ala Glu Leu Asn Tyr
    1070              1075          1080


Thr Val Gln Lys Leu Gln Thr Leu Ile Asp Asn Ile Asn Ser Thr
    1085              1090          1095


Leu Val Asp Leu Lys Trp Leu Asn Arg Val Glu Thr Tyr Ile Lys
    1100              1105          1110


Trp Pro Trp Trp Val Trp Leu Cys Ile Ser Val Val Leu Ile Phe
    1115              1120          1125


Val Val Ser Met Leu Leu Leu Cys Cys Cys Ser Thr Gly Cys Cys
    1130              1135          1140


Gly Phe Phe Ser Cys Phe Ala Ser Ser Ile Arg Gly Cys Cys Glu
    1145              1150          1155


Ser Thr Lys Leu Pro Tyr Tyr Asp Val Glu Lys Ile His Ile Gln
    1160              1165          1170


<210>  53
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<213>  Avian infectious bronchitis virus

<400>  53

Met Leu Gly Lys Ser Leu Phe Leu Val Thr Ile Leu Cys Ala Leu Cys
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Ser Ala Asn Leu Phe Asp Pro Ala Asn Tyr Val Tyr Tyr Tyr Gln Ser
           20             25             30


Ala Phe Arg Pro Ser Asn Gly Trp His Leu Gln Gly Gly Ala Tyr Ala
       35             40             45


Val Val Asn Ser Ser Asn Tyr Ala Asn Asn Ala Gly Ser Ala Ser Glu
    50             55             60


Cys Thr Val Gly Val Ile Lys Asp Val Tyr Asn Gln Ser Ala Ala Ser
65             70             75             80
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Ile Ala Met Thr Ala Pro Leu Gln Gly Met Ala Trp Ser Lys Ser Gln
            85              90                  95

Phe Cys Ser Ala His Cys Asp Phe Ser Glu Ile Thr Val Phe Val Thr
            100             105                 110

His Cys Tyr Ser Ser Gly Ser Gly Ser Cys Pro Ile Thr Gly Met Ile
            115             120                 125

Ala Arg Gly His Ile Arg Ile Ser Ala Met Lys Asn Gly Ser Leu Phe
    130             135             140

Tyr Asn Leu Thr Val Ser Val Ser Lys Tyr Pro Asn Phe Lys Ser Phe
145             150             155                 160

Gln Cys Val Asn Asn Phe Thr Ser Val Tyr Leu Asn Gly Asp Leu Val
            165             170                 175

Phe Thr Ser Asn Lys Thr Thr Asp Val Thr Ser Ala Gly Val Tyr Phe
            180             185                 190

Lys Ala Gly Gly Pro Val Asn Tyr Ser Ile Met Lys Glu Phe Lys Val
            195             200             205

Leu Ala Tyr Phe Val Asn Gly Thr Ala Gln Asp Val Ile Leu Cys Asp
    210             215             220

Asn Ser Pro Lys Gly Leu Leu Ala Cys Gln Tyr Asn Thr Gly Asn Phe
225             230             235                 240

Ser Asp Gly Phe Tyr Pro Phe Thr Asn Ser Thr Leu Val Arg Glu Lys
            245             250                 255

Phe Ile Val Tyr Arg Glu Ser Ser Val Asn Thr Thr Leu Ala Leu Thr
            260             265             270

Asn Phe Thr Phe Thr Asn Val Ser Asn Ala Gln Pro Asn Ser Gly Gly
    275             280             285

Val His Thr Phe His Leu Tyr Gln Thr Gln Thr Ala Gln Ser Gly Tyr
    290             295             300

Tyr Asn Phe Asn Leu Ser Phe Leu Ser Gln Phe Val Tyr Lys Ala Ser
305             310             315                 320

Asp Tyr Met Tyr Gly Ser Tyr His Pro Ile Cys Ala Phe Arg Pro Glu
            325             330                 335
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Thr Ile Asn Ser Gly Leu Trp Phe Asn Ser Leu Ser Val Ser Leu Thr
        340             345             350

Tyr Gly Pro Leu Gln Gly Gly Tyr Lys Gln Ser Val Phe Ser Gly Lys
        355             360             365

Ala Thr Cys Cys Tyr Ala Tyr Ser Tyr Asn Gly Pro Arg Ala Cys Lys
        370             375             380

Gly Val Tyr Ser Gly Glu Leu Ser Arg Asp Phe Glu Cys Gly Leu Leu
385             390             395             400

Val Tyr Val Thr Lys Ser Asp Gly Ser Arg Ile Gln Thr Arg Thr Glu
            405             410             415

Pro Leu Val Leu Thr Gln His Asn Tyr Asn Asn Ile Thr Leu Asp Lys
            420             425             430

Cys Val Ala Tyr Asn Ile Tyr Gly Arg Val Gly Gln Gly Phe Ile Thr
            435             440             445

Asn Val Thr Asp Ser Val Ala Asn Phe Ser Tyr Leu Ala Asp Gly Gly
    450             455             460

Leu Ala Ile Leu Asp Thr Ser Gly Ala Ile Asp Val Phe Val Val Gln
465             470             475             480

Gly Ser Tyr Gly Leu Asn Tyr Tyr Lys Val Asn Pro Cys Glu Asp Val
            485             490             495

Asn Gln Gln Phe Val Val Ser Gly Gly Asn Ile Val Gly Ile Leu Thr
            500             505             510

Ser Arg Asn Glu Thr Gly Ser Glu Gln Val Glu Asn Gln Phe Tyr Val
        515             520             525

Lys Leu Thr Asn Ser Ser His Arg Arg Arg Ser Ile Gly Gln Asn
        530             535             540

Val Thr Ser Cys Pro Tyr Val Ser Tyr Gly Arg Phe Cys Ile Glu Pro
545             550             555             560

Asp Gly Ser Leu Lys Met Ile Val Pro Glu Glu Leu Lys Gln Phe Val
            565             570             575

Ala Pro Leu Leu Asn Ile Thr Glu Ser Val Leu Ile Pro Asn Ser Phe
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                     580                 585                 590

Asn Leu Thr Val Thr Asp Glu Tyr Ile Gln Thr Arg Met Asp Lys Val
        595                 600                 605


Gln Ile Asn Cys Leu Gln Tyr Val Cys Gly Asn Ser Leu Glu Cys Arg
    610                 615                 620


Lys Leu Phe Gln Gln Tyr Gly Pro Val Cys Asp Asn Ile Leu Ser Val
625                 630                 635                 640


Val Asn Ser Val Ser Gln Lys Glu Asp Met Glu Leu Leu Ser Phe Tyr
            645                 650                 655


Ser Ser Thr Lys Pro Lys Gly Tyr Asp Thr Pro Val Leu Ser Asn Val
            660                 665                 670


Ser Thr Gly Glu Phe Asn Ile Ser Leu Leu Leu Thr Pro Pro Ser Ser
        675                 680                 685


Pro Ser Gly Arg Ser Phe Val Glu Asp Leu Leu Phe Thr Ser Val Glu
    690                 695                 700


Thr Val Gly Leu Pro Thr Asp Ala Glu Tyr Lys Lys Cys Thr Ala Gly
705                 710                 715                 720


Pro Leu Gly Thr Leu Lys Asp Leu Ile Cys Ala Arg Glu Tyr Asn Gly
            725                 730                 735


Leu Leu Val Leu Pro Pro Ile Ile Thr Ala Asp Met Gln Thr Met Tyr
            740                 745                 750


Thr Ala Ser Leu Val Gly Ala Met Ala Phe Gly Gly Ile Thr Ser Ala
        755                 760                 765


Ala Ala Ile Pro Phe Ala Thr Gln Ile Gln Ala Arg Ile Asn His Leu
    770                 775                 780


Gly Ile Ala Gln Ser Leu Leu Met Lys Asn Gln Glu Lys Ile Ala Ala
785                 790                 795                 800


Ser Phe Asn Lys Ala Ile Gly His Met Gln Glu Gly Phe Arg Ser Thr
            805                 810                 815


Ser Leu Ala Leu Gln Gln Val Gln Asp Val Val Asn Lys Gln Ser Ala
            820                 825                 830
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Ile Leu Thr Glu Thr Met Asn Ser Leu Asn Lys Asn Phe Gly Ala Ile
    835   840   845

Ser Ser Val Ile Gln Asp Ile Tyr Ala Gln Leu Asp Ala Ile Gln Ala
    850   855   860

Asp Ala Gln Val Asp Arg Leu Ile Thr Gly Arg Leu Ser Ser Leu Ser
865   870   875   880

Val Leu Ala Ser Ala Lys Gln Ser Glu Tyr Ile Arg Val Ser Gln Gln
         885   890   895

Arg Glu Leu Ala Thr Gln Lys Ile Asn Glu Cys Val Lys Ser Gln Ser
        900   905   910

Asn Arg Tyr Gly Phe Cys Gly Ser Gly Arg His Val Leu Ser Ile Pro
        915   920   925

Gln Asn Ala Pro Asn Gly Ile Val Phe Ile His Phe Thr Tyr Thr Pro
    930   935   940

Glu Thr Phe Val Asn Val Thr Ala Ile Val Gly Phe Cys Val Asn Pro
945   950   955   960

Leu Asn Ala Ser Gln Tyr Ala Ile Val Pro Ala Asn Gly Arg Gly Ile
        965   970   975

Phe Ile Gln Val Asn Gly Thr Tyr Tyr Ile Thr Ser Arg Asp Met Tyr
        980   985   990

Met Pro Arg Asp Ile Thr Ala Gly Asp Ile Val Thr Leu Thr Ser Cys
        995   1000   1005

Gln Ala Asn Tyr Val Asn Val Asn Lys Thr Val Ile Thr Thr Phe
   1010   1015   1020

Val Glu Asp Asp Asp Phe Asn Phe Asp Asp Glu Leu Ser Lys Trp
   1025   1030   1035

Trp Asn Asp Thr Lys His Gly Leu Pro Asp Phe Asp Asp Phe Asn
   1040   1045   1050

Tyr Thr Val Pro Ile Leu Asn Ile Ser Gly Glu Ile Asp Asn Ile
   1055   1060   1065

Gln Gly Val Ile Gln Gly Leu Asn Asp Ser Leu Ile Asn Leu Glu
   1070   1075   1080

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Glu Leu Ser Ile Ile Lys Thr Tyr Ile Lys Trp Pro Trp Tyr Val
    1085            1090            1095

Trp Leu Ala Ile Gly Phe Ala Ile Ile Ile Phe Ile Leu Ile Leu
    1100            1105            1110

Gly Trp Val Phe Phe Met Thr Gly Cys Cys Gly Cys Cys Cys Gly
    1115            1120            1125

Cys Phe Gly Ile Ile Pro Leu Ile Ser Lys Cys Gly Lys Lys Ser
    1130            1135            1140

Ser Tyr Tyr Thr Thr Phe Asp Asn Asp Val Val Thr Glu Gln Tyr
    1145            1150            1155

Arg Pro Lys Lys Ser Val
    1160
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<213> Bovine coronoavirus

<400> 54

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Met Phe Leu Ile Leu Leu Ile Ser Leu Pro Met Ala Phe Ala Val Ile
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Gly Asp Leu Lys Cys Thr Thr Val Ser Ile Asn Asp Val Asp Thr Gly
        20              25              30

Ala Pro Ser Ile Ser Thr Asp Ile Val Asp Val Thr Asn Gly Leu Gly
        35              40              45

Thr Tyr Tyr Val Leu Asp Arg Val Tyr Leu Asn Thr Thr Leu Leu Leu
    50              55              60

Asn Gly Tyr Tyr Pro Thr Ser Gly Ser Thr Tyr Arg Asn Met Ala Leu
65              70              75              80

Lys Gly Thr Leu Leu Leu Ser Arg Leu Trp Phe Lys Pro Pro Phe Leu
            85              90              95

Ser Asp Phe Ile Asn Gly Ile Phe Ala Lys Val Lys Asn Thr Lys Val
            100             105             110

Ile Lys Lys Gly Val Met Tyr Ser Glu Phe Pro Ala Ile Thr Ile Gly
        115             120             125
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Ser Thr Phe Val Asn Thr Ser Tyr Ser Val Val Val Gln Pro His Thr
    130                 135             140


Thr Asn Leu Asp Asn Lys Leu Gln Gly Leu Leu Glu Ile Ser Val Cys
145             150             155                     160


Gln Tyr Thr Met Cys Glu Tyr Pro His Thr Ile Cys His Pro Lys Leu
                165             170                 175


Gly Asn Lys Arg Val Glu Leu Trp His Trp Asp Thr Gly Val Val Ser
            180             185             190


Cys Leu Tyr Lys Arg Asn Phe Thr Tyr Asp Val Asn Ala Asp Tyr Leu
        195             200             205


Tyr Phe His Phe Tyr Gln Glu Gly Gly Thr Phe Tyr Ala Tyr Phe Thr
    210             215             220


Asp Thr Gly Val Val Thr Lys Phe Leu Phe Asn Val Tyr Leu Gly Thr
225             230             235                     240


Val Leu Ser His Tyr Tyr Val Leu Pro Leu Thr Cys Ser Ser Ala Met
            245             250                 255


Thr Leu Glu Tyr Trp Val Thr Pro Leu Thr Ser Lys Gln Tyr Leu Leu
            260             265             270


Ala Phe Asn Gln Asp Gly Val Ile Phe Asn Ala Val Asp Cys Lys Ser
        275             280             285


Asp Phe Met Ser Glu Ile Lys Cys Lys Thr Leu Ser Ile Ala Pro Ser
    290             295             300


Thr Gly Val Tyr Glu Leu Asn Gly Tyr Thr Val Gln Pro Ile Ala Asp
305             310             315                     320


Val Tyr Arg Arg Ile Pro Asn Leu Pro Asp Cys Asn Ile Glu Ala Trp
            325             330             335


Leu Asn Asp Lys Ser Val Pro Ser Pro Leu Asn Trp Glu Arg Lys Thr
            340             345             350


Phe Ser Asn Cys Asn Phe Asn Met Ser Ser Leu Met Ser Phe Ile Gln
    355             360             365


Ala Asp Ser Phe Thr Cys Asn Asn Ile Asp Ala Ala Lys Ile Tyr Gly
    370             375             380
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Met Cys Phe Ser Ser Ile Thr Ile Asp Lys Phe Ala Ile Pro Asn Gly
385             390             395             400

Arg Lys Val Asp Leu Gln Leu Gly Asn Leu Gly Tyr Leu Gln Ser Phe
            405             410             415

Asn Tyr Arg Ile Asp Thr Thr Ala Thr Ser Cys Gln Leu Tyr Tyr Asn
            420             425             430

Leu Pro Ala Ala Asn Val Ser Val Ser Arg Phe Asn Pro Ser Thr Trp
        435             440             445

Asn Arg Arg Phe Gly Phe Thr Glu Gln Phe Val Phe Lys Pro Gln Pro
    450             455             460

Val Gly Val Phe Thr His His Asp Val Val Tyr Ala Gln His Cys Phe
465             470             475             480

Lys Ala Pro Lys Asn Phe Cys Pro Cys Lys Leu Asp Gly Ser Leu Cys
            485             490             495

Val Gly Asn Gly Pro Gly Ile Asp Ala Gly Tyr Lys Asn Ser Gly Ile
        500             505             510

Gly Thr Cys Pro Ala Gly Thr Asn Tyr Leu Thr Cys His Asn Ala Ala
        515             520             525

Gln Cys Asp Cys Leu Cys Thr Pro Asp Pro Ile Thr Ser Lys Ser Thr
    530             535             540

Gly Pro Tyr Lys Cys Pro Gln Thr Lys Tyr Leu Val Gly Ile Gly Glu
545             550             555             560

His Cys Ser Gly Leu Ala Ile Lys Ser Asp Tyr Cys Gly Gly Asn Pro
            565             570             575

Cys Thr Cys Gln Pro Gln Ala Phe Leu Gly Trp Ser Val Asp Ser Cys
            580             585             590

Leu Gln Gly Asp Arg Cys Asn Ile Phe Ala Asn Phe Ile Phe His Asp
        595             600             605

Val Asn Ser Gly Thr Thr Cys Ser Thr Asp Leu Gln Lys Ser Asn Thr
    610             615             620

Asp Ile Ile Leu Gly Val Cys Val Asn Tyr Asp Leu Tyr Gly Ile Thr
                        Page 96
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625   630   635   640

Gly Gln Gly Ile Phe Val Glu Val Asn Ala Thr Tyr Tyr Asn Ser Trp
            645   650   655

Gln Asn Leu Leu Tyr Asp Ser Asn Gly Asn Leu Tyr Gly Phe Arg Asp
        660   665   670

Tyr Leu Thr Asn Arg Thr Phe Met Ile Arg Ser Cys Tyr Ser Gly Arg
        675   680   685

Val Ser Ala Ala Phe His Ala Asn Ser Ser Glu Pro Ala Leu Leu Phe
    690   695   700

Arg Asn Ile Lys Cys Asn Tyr Val Phe Asn Asn Thr Leu Ser Arg Gln
705   710   715   720

Leu Gln Pro Ile Asn Tyr Phe Asp Ser Tyr Leu Gly Cys Val Val Asn
            725   730   735

Ala Asp Asn Ser Thr Ser Ser Val Val Gln Thr Cys Asp Leu Thr Val
            740   745   750

Gly Ser Gly Tyr Cys Val Asp Tyr Ser Thr Lys Arg Arg Ser Arg Arg
        755   760   765

Ala Ile Thr Thr Gly Tyr Arg Phe Thr Asn Phe Glu Pro Phe Thr Val
    770   775   780

Asn Ser Val Asn Asp Ser Leu Glu Pro Val Gly Gly Leu Tyr Glu Ile
785   790   795   800

Gln Ile Pro Ser Glu Phe Thr Ile Gly Asn Met Glu Glu Phe Ile Gln
            805   810   815

Thr Ser Ser Pro Lys Val Thr Ile Asp Cys Ser Ala Phe Val Cys Gly
            820   825   830

Asp Tyr Ala Ala Cys Lys Ser Gln Leu Val Glu Tyr Gly Ser Phe Cys
        835   840   845

Asp Asn Ile Asn Ala Ile Leu Thr Glu Val Asn Glu Leu Leu Asp Thr
    850   855   860

Thr Gln Leu Gln Val Ala Asn Ser Leu Met Asn Gly Val Thr Leu Ser
865   870   875   880

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Thr Lys Leu Lys Asp Gly Val Asn Phe Asn Val Asp Asp Ile Asn Phe
                    885   890   895

Ser Pro Val Leu Gly Cys Leu Gly Ser Ala Cys Asn Lys Val Ser Ser
                900   905   910

Arg Ser Ala Ile Glu Asp Leu Leu Phe Ser Lys Val Lys Leu Ser Asp
            915   920   925

Val Gly Phe Val Glu Ala Tyr Asn Asn Cys Thr Gly Gly Ala Glu Ile
        930   935   940

Arg Asp Leu Ile Cys Val Gln Ser Tyr Asn Gly Ile Lys Val Leu Pro
945   950   955   960

Pro Leu Leu Ser Val Asn Gln Ile Ser Gly Tyr Thr Leu Ala Ala Thr
                965   970   975

Ser Ala Ser Leu Phe Pro Pro Leu Ser Ala Ala Val Gly Val Pro Phe
                980   985   990

Tyr Leu Asn Val Gln Tyr Arg Ile Asn Gly Ile Gly Val Thr Met Asp
                995   1000   1005

Val Leu Ser Gln Asn Gln Lys Leu Ile Ala Asn Ala Phe Asn Asn
        1010   1015   1020

Ala Leu Asp Ala Ile Gln Glu Gly Phe Asp Ala Thr Asn Ser Ala
        1025   1030   1035

Leu Val Lys Ile Gln Ala Val Val Asn Ala Asn Ala Glu Ala Leu
        1040   1045   1050

Asn Asn Leu Leu Gln Gln Leu Ser Asn Arg Phe Gly Ala Ile Ser
        1055   1060   1065

Ser Ser Leu Gln Glu Ile Leu Ser Arg Leu Asp Ala Leu Glu Ala
        1070   1075   1080

Gln Ala Gln Ile Asp Arg Leu Ile Asn Gly Arg Leu Thr Ala Leu
        1085   1090   1095

Asn Val Tyr Val Ser Gln Gln Leu Ser Asp Ser Thr Leu Val Lys
        1100   1105   1110

Phe Ser Ala Ala Gln Ala Met Glu Lys Val Asn Glu Cys Val Lys
        1115   1120   1125

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Ser Gln Ser Ser Arg Ile Asn Phe Cys Gly Asn Gly Asn His Ile
    1130   1135   1140

Ile Ser Leu Val Gln Asn Ala Pro Tyr Gly Leu Tyr Phe Ile His
    1145   1150   1155

Phe Ser Tyr Val Pro Thr Lys Tyr Val Thr Ala Lys Val Ser Pro
    1160   1165   1170

Gly Leu Cys Ile Ala Gly Asp Arg Gly Ile Ala Pro Lys Ser Gly
    1175   1180   1185

Tyr Phe Val Asn Val Asn Asn Thr Trp Met Phe Thr Gly Ser Gly
    1190   1195   1200

Tyr Tyr Tyr Pro Glu Pro Ile Thr Gly Asn Asn Val Val Val Met
    1205   1210   1215

Ser Thr Cys Ala Val Asn Tyr Thr Lys Ala Pro Asp Val Met Leu
    1220   1225   1230

Asn Ile Ser Thr Pro Asn Leu His Asp Phe Lys Glu Glu Leu Asp
    1235   1240   1245

Gln Trp Phe Lys Asn Gln Thr Ser Val Ala Pro Asp Leu Ser Leu
    1250   1255   1260

Asp Tyr Ile Asn Val Thr Phe Leu Asp Leu Gln Asp Glu Met Asn
    1265   1270   1275

Arg Leu Gln Glu Ala Ile Lys Val Leu Asn Gln Ser Tyr Ile Asn
    1280   1285   1290

Leu Lys Asp Ile Gly Thr Tyr Glu Tyr Tyr Val Lys Trp Pro Trp
    1295   1300   1305

Tyr Val Trp Leu Leu Ile Gly Phe Ala Gly Val Ala Met Leu Val
    1310   1315   1320

Leu Leu Phe Phe Ile Cys Cys Cys Thr Gly Cys Gly Thr Ser Cys
    1325   1330   1335

Phe Lys Ile Cys Gly Gly Cys Cys Asp Asp Tyr Thr Gly His Gln
    1340   1345   1350

Glu Leu Val Ile Lys Thr Ser His Asp Asp
    1355   1360

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<212> PRT
<213> canine coronavirus

<400> 55

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1   5   10   15

Ile Cys Thr Ser Asn Asn Asp Cys Val Gln Gly Asn Val Thr Gln Leu
            20   25   30

Pro Gly Asn Glu Asn Ile Ile Lys Asp Phe Leu Phe His Thr Phe Lys
        35   40   45

Glu Glu Pro Ser Val Val Val Gly Gly Tyr Tyr Pro Thr Glu Val Trp
    50   55   60

Tyr Asn Cys Ser Arg Ser Ala Thr Thr Thr Ala Tyr Lys Asp Phe Ser
65   70   75   80

Asn Ile His Ala Phe Tyr Phe Asp Met Glu Ala Met Glu Asn Ser Thr
                85   90   95

Gly Asn Ala Arg Gly Lys Pro Leu Leu Val His Val His Gly Asp Pro
                100   105   110

Val Ser Ile Ile Ile Tyr Ile Ser Ala Tyr Arg Asp Asp Val Gln Pro
            115   120   125

Arg Pro Leu Leu Lys His Gly Leu Leu Cys Ile Thr Lys Asn Lys Ile
    130   135   140

Ile Asp Tyr Asn Thr Phe Thr Ser Ala Gln Trp Ser Ala Ile Cys Leu
145   150   155   160

Gly Asp Asp Arg Lys Ile Pro Phe Ser Val Ile Pro Thr Asp Asn Gly
                165   170   175

Thr Lys Ile Phe Gly Leu Glu Trp Asn Asp Asp Tyr Val Thr Ala Tyr
                180   185   190

Ile Ser Asp Arg Ser His His Leu Asn Ile Asn Asn Asn Trp Phe Asn
            195   200   205

Asn Val Thr Ile Leu Tyr Ser Arg Ser Ser Ser Ala Thr Trp Gln Lys
    210   215   220
                        Page 100

Ser Ala Ala Tyr Val Tyr Gln Gly Val Ser Asn Phe Thr Tyr Tyr Lys
225   230   235   240

Leu Asn Asn Thr Asn Gly Leu Lys Ser Tyr Glu Leu Cys Glu Asp Tyr
            245   250   255

Glu Tyr Cys Thr Gly Tyr Ala Thr Asn Val Phe Ala Pro Thr Val Gly
        260   265   270

Gly Tyr Ile Pro His Gly Phe Ser Phe Asn Asn Trp Phe Met Arg Thr
        275   280   285

Asn Ser Ser Thr Phe Val Ser Gly Arg Phe Val Thr Asn Gln Pro Leu
    290   295   300

Leu Val Asn Cys Leu Trp Pro Val Pro Ser Phe Gly Val Ala Ala Gln
305   310   315   320

Gln Phe Cys Phe Glu Gly Ala Gln Phe Ser Gln Cys Asn Gly Val Ser
            325   330   335

Leu Asn Asn Thr Val Asp Val Ile Arg Phe Asn Leu Asn Phe Thr Ala
            340   345   350

Leu Val Gln Ser Gly Met Gly Ala Thr Val Phe Ser Leu Asn Thr Thr
            355   360   365

Gly Gly Val Ile Leu Glu Ile Ser Cys Tyr Asn Asp Thr Val Ser Glu
    370   375   380

Ser Ser Phe Tyr Ser Tyr Gly Glu Ile Ser Phe Gly Val Thr Asp Gly
385   390   395   400

Pro Arg Tyr Cys Phe Ala Leu Tyr Asn Gly Thr Ala Leu Lys Tyr Leu
            405   410   415

Gly Thr Leu Pro Pro Ser Val Lys Glu Ile Ala Ile Ser Lys Trp Gly
            420   425   430

His Phe Tyr Ile Asn Gly Tyr Asn Phe Phe Ser Thr Phe Pro Ile Asp
        435   440   445

Cys Ile Ser Phe Asn Leu Thr Thr Gly Asp Ser Gly Ala Phe Trp Thr
    450   455   460

Ile Ala Tyr Thr Ser Tyr Thr Asp Ala Leu Val Gln Val Glu Asn Thr

465   470   475   480

Ala Ile Lys Lys Val Thr Tyr Cys Asn Ser His Ile Asn Asn Ile Lys
            485   490   495

Cys Ser Gln Leu Thr Ala Asn Leu Gln Asn Gly Phe Tyr Pro Val Ala
            500   505   510

Ser Ser Glu Val Gly Leu Val Asn Lys Ser Val Val Leu Leu Pro Ser
            515   520   525

Phe Tyr Ser His Thr Ser Val Asn Ile Thr Ile Asp Leu Gly Met Lys
    530   535   540

Arg Ser Gly Tyr Gly Gln Pro Ile Ala Ser Thr Leu Ser Asn Ile Thr
545   550   555   560

Leu Pro Met Gln Asp Asn Asn Thr Asp Val Tyr Cys Ile Arg Ser Asn
            565   570   575

Arg Phe Ser Val Tyr Phe His Ser Thr Cys Lys Ser Ser Leu Trp Asp
            580   585   590

Asp Val Phe Asn Ser Asp Cys Thr Asp Val Leu Tyr Ala Thr Ala Val
            595   600   605

Ile Lys Thr Gly Thr Cys Pro Phe Ser Phe Asp Lys Leu Asn Asn Tyr
    610   615   620

Leu Thr Phe Asn Lys Phe Cys Leu Ser Leu Asn Pro Val Gly Ala Asn
625   630   635   640

Cys Lys Phe Asp Val Ala Ala Arg Thr Arg Thr Asn Glu Gln Val Val
            645   650   655

Arg Ser Leu Tyr Val Ile Tyr Glu Glu Gly Asp Asn Ile Val Gly Val
            660   665   670

Pro Ser Asp Asn Ser Gly Leu His Asp Leu Ser Val Leu His Leu Asp
            675   680   685

Ser Cys Thr Asp Tyr Asn Ile Tyr Gly Ile Thr Gly Val Gly Ile Ile
    690   695   700

Arg Gln Thr Asn Ser Thr Leu Leu Ser Gly Leu Tyr Tyr Thr Ser Leu
705   710   715   720

Ser Gly Asp Leu Leu Gly Phe Lys Asn Val Ser Asp Gly Val Ile Tyr
            725   730   735

Ser Val Thr Pro Cys Asp Val Ser Ala His Ala Ala Val Ile Asp Gly
            740   745   750

Ala Ile Val Gly Ala Met Thr Ser Ile Asn Ser Glu Leu Leu Gly Leu
            755   760   765

Thr His Trp Thr Thr Thr Pro Asn Phe Tyr Tyr Tyr Ser Ile Tyr Asn
    770   775   780

Tyr Thr Asn Glu Arg Thr Arg Gly Thr Ala Ile Asp Ser Asn Asp Val
785   790   795   800

Asp Cys Glu Pro Ile Ile Thr Tyr Ser Asn Ile Gly Val Cys Lys Asn
            805   810   815

Gly Ala Leu Val Phe Ile Asn Val Thr His Ser Asp Gly Asp Val Gln
            820   825   830

Pro Ile Ser Thr Gly Asn Val Thr Ile Pro Thr Asn Phe Thr Ile Ser
            835   840   845

Val Gln Val Glu Tyr Ile Gln Val Tyr Thr Thr Pro Val Ser Ile Asp
    850   855   860

Cys Ser Arg Tyr Val Cys Asn Gly Asn Pro Arg Cys Asn Lys Leu Leu
865   870   875   880

Thr Gln Tyr Val Ser Ala Cys Gln Thr Ile Glu Gln Ala Leu Ala Met
            885   890   895

Gly Ala Arg Leu Glu Asn Met Glu Ile Asp Ser Met Leu Phe Val Ser
            900   905   910

Glu Asn Ala Leu Lys Leu Ala Ser Val Glu Ala Phe Asn Ser Thr Glu
            915   920   925

Thr Leu Asp Pro Ile Tyr Lys Glu Trp Pro Asn Ile Gly Gly Ser Trp
    930   935   940

Leu Gly Gly Leu Lys Asp Ile Leu Pro Ser His Asn Ser Lys Arg Lys
945   950   955   960

Tyr Arg Ser Ala Ile Glu Asp Leu Leu Phe Asp Lys Val Val Thr Ser
            965   970   975

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Gly Leu Gly Thr Val Asp Glu Asp Tyr Lys Arg Cys Thr Gly Gly Tyr
        980   985   990

Asp Ile Ala Asp Leu Val Cys Ala Gln Tyr Tyr Asn Gly Ile Met Val
        995   1000   1005

Leu Pro Gly Val Ala Asn Asp Asp Lys Met Ala Met Tyr Thr Ala
    1010   1015   1020

Ser Leu Ala Gly Gly Ile Thr Leu Gly Ser Leu Gly Gly Gly Ala
    1025   1030   1035

Val Ser Ile Pro Phe Ala Ile Ala Val Gln Ala Arg Leu Asn Tyr
    1040   1045   1050

Val Ala Leu Gln Thr Asp Val Leu Asn Lys Asn Gln Gln Ile Leu
    1055   1060   1065

Ala Asn Ala Phe Asn Gln Ala Ile Gly Asn Ile Thr Gln Ala Phe
    1070   1075   1080

Gly Lys Val Asn Asp Ala Ile His Gln Thr Ser Gln Gly Leu Ala
    1085   1090   1095

Thr Val Ala Lys Val Leu Ala Lys Val Gln Asp Val Val Asn Thr
    1100   1105   1110

Gln Gly Gln Ala Leu Ser His Leu Thr Leu Gln Leu Gln Asn Asn
    1115   1120   1125

Phe Gln Ala Ile Ser Ser Ser Ile Ser Asp Ile Tyr Asn Arg Leu
    1130   1135   1140

Asp Glu Leu Ser Ala Asp Ala Gln Val Asp Arg Leu Ile Thr Gly
    1145   1150   1155

Arg Leu Thr Ala Leu Asn Ala Phe Val Ser Gln Thr Leu Thr Arg
    1160   1165   1170

Gln Ala Glu Val Arg Ala Ser Arg Gln Leu Ala Lys Asp Lys Val
    1175   1180   1185

Asn Glu Cys Val Arg Ser Gln Ser Gln Arg Phe Gly Phe Cys Gly
    1190   1195   1200

Asn Gly Thr His Leu Phe Ser Leu Ala Asn Ala Ala Pro Asn Gly
    1205   1210   1215
                        Page 104

```
Met Ile Phe Phe His Thr Val Leu Leu Pro Thr Ala Tyr Glu Thr
    1220            1225            1230

Val Thr Ala Trp Ser Gly Ile Cys Ala Ser Asp Gly Asp Arg Thr
    1235            1240            1245

Phe Gly Leu Val Val Lys Asp Val Gln Leu Thr Leu Phe Arg Asn
    1250            1255            1260

Leu Asp Asp Lys Phe Tyr Leu Thr Pro Arg Thr Met Tyr Gln Pro
    1265            1270            1275

Ile Val Ala Thr Ser Ser Asp Phe Val Gln Ile Glu Gly Cys Asp
    1280            1285            1290

Val Leu Phe Val Asn Ala Thr Val Ile Asp Leu Pro Ser Ile Ile
    1295            1300            1305

Pro Asp Tyr Ile Asp Ile Asn Gln Thr Val Gln Asp Ile Leu Glu
    1310            1315            1320

Asn Phe Arg Pro Asn Trp Thr Val Pro Glu Leu Pro Leu Asp Ile
    1325            1330            1335

Phe Asn Ala Thr Tyr Leu Asn Leu Thr Gly Glu Ile Asn Asp Leu
    1340            1345            1350

Glu Phe Arg Ser Glu Lys Leu His Asn Thr Thr Val Glu Leu Ala
    1355            1360            1365

Ile Leu Ile Asp Asn Ile Asn Asn Thr Leu Val Asn Leu Glu Trp
    1370            1375            1380

Leu Asn Arg Ile Glu Thr Tyr Val Lys Trp Pro Trp Tyr Val Trp
    1385            1390            1395

Leu Leu Ile Gly Leu Val Val Ile Phe Cys Ile Pro Ile Leu Leu
    1400            1405            1410

Phe Cys Cys Cys Ser Thr Gly Cys Cys Gly Cys Ile Gly Cys Leu
    1415            1420            1425

Gly Ser Cys Cys His Ser Ile Cys Ser Arg Arg Gln Phe Glu Ser
    1430            1435            1440

Tyr Glu Pro Ile Glu Lys Val His Val His
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<210> 56
<211> 1464
<212> PRT
<213> Feline infectious peritonitis virus

<400> 56

Met Ile Phe Ile Ile Leu Thr Leu Leu Ser Val Ala Lys Ser Glu Asp
1   5   10   15

Ala Pro His Gly Val Thr Leu Pro Gln Phe Asn Thr Ser His Asn Asn
            20   25   30

Glu Arg Phe Glu Leu Asn Phe Tyr Asn Phe Leu Gln Thr Trp Asp Ile
        35   40   45

Pro Pro Asn Thr Glu Thr Ile Leu Gly Gly Tyr Leu Pro Tyr Cys Gly
    50   55   60

Ala Gly Val Asn Cys Gly Trp Tyr Asn Phe Ser Gln Ser Val Gly Gln
65   70   75   80

Asn Gly Lys Tyr Ala Tyr Ile Asn Thr Gln Asn Leu Asn Ile Pro Asn
                85   90   95

Val His Gly Val Tyr Phe Asp Val Arg Glu His Asn Asn Asp Gly Glu
            100   105   110

Trp Asp Asp Arg Asp Lys Val Gly Leu Leu Ile Ala Ile His Gly Asn
        115   120   125

Ser Lys Tyr Ser Leu Leu Met Val Leu Gln Asp Ala Val Glu Ala Asn
    130   135   140

Gln Pro His Val Ala Val Lys Ile Cys His Trp Lys Pro Gly Asn Ile
145   150   155   160

Ser Ser Tyr His Ala Phe Ser Val Asn Leu Gly Asp Gly Gly Gln Cys
                165   170   175

Val Phe Asn Gln Arg Phe Ser Leu Asp Thr Val Leu Thr Thr Asn Asp
            180   185   190

Phe Tyr Gly Phe Gln Trp Thr Asp Thr Tyr Val Asp Ile Tyr Leu Gly
        195   200   205

Gly Thr Ile Thr Lys Val Trp Val Asp Asn Asp Trp Ser Ile Val Glu

Ala Ser Ile Ser Tyr His Trp Asn Arg Ile Asn Tyr Gly Tyr Tyr Met
225   230   235   240

Gln Phe Val Asn Arg Thr Thr Tyr Tyr Ala Tyr Asn Asn Thr Gly Gly
            245   250   255

Ala Asn Tyr Thr Gln Leu Gln Leu Ser Glu Cys His Thr Asp Tyr Cys
        260   265   270

Ala Gly Tyr Ala Lys Asn Val Phe Val Pro Ile Asp Gly Lys Ile Pro
        275   280   285

Glu Asp Phe Ser Phe Ser Asn Trp Phe Leu Leu Ser Asp Lys Ser Thr
    290   295   300

Leu Val Gln Gly Arg Val Leu Ser Ser Gln Pro Val Phe Val Gln Cys
305   310   315   320

Leu Arg Pro Val Pro Ser Trp Ser Asn Asn Thr Ala Val Val His Phe
            325   330   335

Lys Asn Asp Ala Phe Cys Pro Asn Val Thr Ala Asp Val Leu Arg Phe
            340   345   350

Asn Leu Asn Phe Ser Asp Thr Asp Val Tyr Thr Asp Ser Thr Asn Asp
        355   360   365

Glu Gln Leu Phe Phe Thr Phe Glu Asp Asn Thr Thr Ala Ser Ile Ala
    370   375   380

Cys Tyr Ser Ser Ala Asn Val Thr Asp Phe Gln Pro Ala Asn Asn Ser
385   390   395   400

Val Ser His Ile Pro Phe Gly Lys Thr Ala His Phe Cys Phe Ala Asn
            405   410   415

Phe Ser His Ser Ile Val Ser Arg Gln Phe Leu Gly Ile Leu Pro Pro
            420   425   430

Thr Val Arg Glu Phe Ala Phe Gly Arg Asp Gly Ser Ile Phe Val Asn
        435   440   445

Gly Tyr Lys Tyr Phe Ser Leu Pro Ala Ile Arg Ser Val Asn Phe Ser
    450   455   460

Ile Ser Ser Val Glu Glu Tyr Gly Phe Trp Thr Ile Ala Tyr Thr Asn
465   470   475   480

Tyr Thr Asp Val Met Val Asp Val Asn Gly Thr Ala Ile Thr Arg Leu
                485   490   495

Phe Tyr Cys Asp Ser Pro Leu Asn Arg Ile Lys Cys Gln Gln Leu Lys
            500   505   510

His Glu Leu Pro Asp Gly Phe Tyr Ser Ala Ser Met Leu Val Lys Lys
        515   520   525

Asp Leu Pro Lys Thr Phe Val Thr Met Pro Gln Phe Tyr His Trp Met
    530   535   540

Asn Val Thr Leu His Val Val Leu Asn Asp Thr Glu Lys Lys Tyr Asp
545   550   555   560

Ile Ile Leu Ala Lys Ala Pro Glu Leu Ala Ala Leu Ala Asp Val His
            565   570   575

Phe Glu Ile Ala Gln Ala Asn Gly Ser Val Thr Asn Val Thr Ser Leu
        580   585   590

Cys Val Gln Ala Arg Gln Leu Ala Leu Phe Tyr Lys Tyr Thr Ser Leu
        595   600   605

Gln Gly Leu Tyr Thr Tyr Ser Asn Leu Val Glu Leu Gln Asn Tyr Asp
    610   615   620

Cys Pro Phe Ser Pro Gln Gln Phe Asn Asn Tyr Leu Gln Phe Glu Thr
625   630   635   640

Leu Cys Phe Asp Val Asn Pro Ala Val Ala Gly Cys Lys Trp Ser Leu
            645   650   655

Val His Asp Val Gln Trp Arg Thr Gln Phe Ala Thr Ile Thr Val Ser
        660   665   670

Tyr Lys His Gly Ser Met Ile Thr Thr His Ala Lys Gly His Ser Trp
        675   680   685

Gly Phe Gln Asp Thr Ser Val Leu Val Lys Asp Glu Cys Thr Asp Tyr
    690   695   700

Asn Ile Tyr Gly Phe Gln Gly Thr Gly Ile Ile Arg Asn Thr Thr Ser
705   710   715   720

Arg Leu Val Ala Gly Leu Tyr Tyr Thr Ser Ile Ser Gly Asp Leu Leu
                725   730   735

Ala Phe Lys Asn Ser Thr Thr Gly Glu Ile Phe Thr Val Val Pro Cys
            740   745   750

Asp Leu Thr Ala Gln Val Ala Val Ile Asn Asp Glu Ile Val Gly Ala
        755   760   765

Ile Thr Ala Val Asn Gln Thr Asp Leu Phe Glu Phe Val Asn Asn Thr
    770   775   780

Gln Ala Arg Arg Ser Arg Ser Ser Thr Pro Asn Phe Val Thr Ser Tyr
785   790   795   800

Thr Met Pro Gln Phe Tyr Tyr Ile Thr Lys Trp Asn Asn Asp Thr Ser
            805   810   815

Ser Asn Cys Thr Ser Ala Ile Thr Tyr Ser Ser Phe Ala Ile Cys Asn
            820   825   830

Thr Gly Glu Ile Lys Tyr Val Asn Val Thr His Val Glu Ile Val Asp
            835   840   845

Asp Ser Ile Gly Val Ile Lys Pro Val Ser Thr Gly Asn Ile Ser Ile
    850   855   860

Pro Lys Asn Phe Thr Val Ala Val Gln Ala Glu Tyr Ile Gln Ile Gln
865   870   875   880

Val Lys Pro Val Val Val Asp Cys Ala Thr Tyr Val Cys Asn Gly Asn
            885   890   895

Thr His Cys Leu Lys Leu Leu Thr Gln Tyr Thr Ser Ala Cys Gln Thr
            900   905   910

Ile Glu Asn Ala Leu Asn Leu Gly Ala Arg Leu Glu Ser Leu Met Leu
    915   920   925

Asn Asp Met Ile Thr Val Ser Asp Arg Gly Leu Glu Leu Ala Thr Val
    930   935   940

Glu Arg Phe Asn Ala Thr Ala Leu Gly Gly Glu Lys Leu Gly Gly Leu
945   950   955   960

Tyr Phe Asp Gly Leu Ser Ser Leu Leu Pro Pro Lys Ile Gly Lys Arg
            965   970   975

Ser Ala Val Glu Asp Leu Leu Phe Asn Lys Val Val Thr Ser Gly Leu
      980   985   990

Gly Thr Val Asp Asp Asp Tyr Lys Lys Cys Ser Ser Gly Thr Asp Val
      995   1000   1005

Ala Asp Leu Val Cys Ala Gln Tyr Tyr Asn Gly Ile Met Val Leu
    1010   1015   1020

Pro Gly Val Val Asp Gly Asn Lys Met Ser Met Tyr Thr Ala Ser
    1025   1030   1035

Leu Ile Gly Gly Met Ala Leu Gly Ser Ile Thr Ser Ala Val Ala
    1040   1045   1050

Val Pro Phe Ala Met Gln Val Gln Ala Arg Leu Asn Tyr Val Ala
    1055   1060   1065

Leu Gln Thr Asp Val Leu Gln Glu Asn Gln Lys Ile Leu Ala Asn
    1070   1075   1080

Ala Phe Asn Asn Ala Ile Gly Asn Ile Thr Leu Ala Leu Gly Lys
    1085   1090   1095

Val Ser Asn Ala Ile Thr Thr Thr Ser Asp Gly Phe Asn Ser Met
    1100   1105   1110

Ala Ser Ala Leu Thr Lys Ile Gln Ser Val Val Asn Gln Gln Gly
    1115   1120   1125

Glu Ala Leu Ser Gln Leu Thr Ser Gln Leu Gln Lys Asn Phe Gln
    1130   1135   1140

Ala Ile Ser Ser Ser Ile Ala Glu Ile Tyr Asn Arg Leu Glu Lys
    1145   1150   1155

Val Glu Ala Asp Ala Gln Val Asp Arg Leu Ile Thr Gly Arg Leu
    1160   1165   1170

Ala Ala Leu Asn Ala Tyr Val Ser Gln Thr Leu Thr Gln Tyr Ala
    1175   1180   1185

Glu Val Lys Ala Ser Arg Gln Ile Ala Leu Glu Lys Val Asn Glu
    1190   1195   1200

Cys Val Lys Ser Gln Ser Asn Arg Tyr Gly Phe Cys Gly Asn Gly

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     1205                    1210                  1215


Thr His  Leu Phe Ser Leu Val  Asn Ser Ala Pro Glu  Gly Leu Leu
     1220                    1225                  1230


Phe Phe  His Thr Val Leu Leu  Pro Thr Glu Trp Glu  Glu Val Thr
     1235                    1240                  1245


Ala Trp  Ser Gly Ile Cys Val  Asn Asp Thr Tyr Ala  Tyr Val Leu
     1250                    1255                  1260


Lys Asp  Phe Asp His Ser Ile  Phe Ser Tyr Asn Gly  Thr Tyr Met
     1265                    1270                  1275


Val Thr  Pro Arg Asn Met Phe  Gln Pro Arg Lys Pro  Gln Met Ser
     1280                    1285                  1290


Asp Phe  Val Gln Ile Thr Ser  Cys Glu Val Thr Phe  Leu Asn Met
     1295                    1300                  1305


Thr Tyr  Thr Thr Phe Gln Glu  Ile Val Ile Asp Tyr  Ile Asp Ile
     1310                    1315                  1320


Asn Lys  Thr Ile Ala Asp Met  Leu Glu Gln Tyr Asn  Pro Asn Tyr
     1325                    1330                  1335


Thr Thr  Pro Glu Leu Asn Leu  Leu Leu Asp Ile Phe  Asn Gln Thr
     1340                    1345                  1350


Lys Leu  Asn Leu Thr Ala Glu  Ile Asp Gln Leu Glu  Gln Arg Ala
     1355                    1360                  1365


Asp Asn  Leu Thr Thr Ile Ala  His Glu Leu Gln Gln  Tyr Ile Asp
     1370                    1375                  1380


Asn Leu  Asn Lys Thr Leu Val  Asp Leu Asp Trp Leu  Asn Arg Ile
     1385                    1390                  1395


Glu Thr  Tyr Val Lys Trp Pro  Trp Tyr Val Trp Leu  Leu Ile Gly
     1400                    1405                  1410


Leu Val  Val Val Phe Cys Ile  Pro Leu Leu Leu Phe  Cys Cys Leu
     1415                    1420                  1425


Ser Thr  Gly Phe Cys Gly Cys  Phe Gly Cys Val Gly  Ser Cys Cys
     1430                    1435                  1440
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His Ser  Leu Cys Ser Arg Arg  Gln Phe Glu Thr Tyr  Glu Pro Ile
    1445                1450                1455


Glu Lys  Val His Ile His
    1460


<210>  57
<211>  1235
<212>  PRT
<213>  Mouse hepatitis virus

<400>  57

Met Leu Phe Val Phe Ile Leu Leu Leu Pro Ser Cys Leu Gly Tyr Ile
1               5                   10                  15


Gly Asp Phe Arg Cys Ile Gln Thr Val Asn Tyr Asn Gly Asn Asn Ala
                20              25              30


Ser Ala Pro Ser Ile Ser Thr Glu Ala Val Asp Val Ser Lys Gly Arg
        35                  40                  45


Gly Thr Tyr Tyr Val Leu Asp Arg Val Tyr Leu Asn Ala Thr Leu Leu
    50              55                  60


Leu Thr Gly Tyr Tyr Pro Val Asp Gly Ser Asn Tyr Arg Asn Leu Ala
65                  70                  75                  80


Leu Thr Gly Thr Asn Thr Leu Ser Leu Thr Trp Phe Lys Pro Pro Phe
                85                  90                  95


Leu Ser Glu Phe Asn Asp Gly Ile Phe Ala Lys Val Gln Asn Leu Lys
                100                 105                 110


Thr Asn Thr Pro Thr Gly Ala Thr Ser Tyr Phe Pro Thr Ile Val Ile
        115                 120                 125


Gly Ser Leu Phe Gly Asn Thr Ser Tyr Thr Val Val Leu Glu Pro Tyr
    130                 135                 140


Asn Asn Ile Ile Met Ala Ser Val Cys Thr Tyr Thr Ile Cys Gln Leu
145                 150                 155                 160


Pro Tyr Thr Pro Cys Lys Pro Asn Thr Asn Gly Asn Arg Val Ile Gly
                165                 170                 175


Phe Trp His Thr Asp Val Lys Pro Pro Ile Cys Leu Leu Lys Arg Asn
                180                 185                 190
```

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```
Phe Thr Phe Asn Val Asn Ala Pro Trp Leu Tyr Phe His Phe Tyr Gln
        195             200                 205


Gln Gly Gly Thr Phe Tyr Ala Tyr Tyr Ala Asp Lys Pro Ser Ala Thr
        210             215                 220


Thr Phe Leu Phe Ser Val Tyr Ile Gly Asp Ile Leu Thr Gln Tyr Phe
225             230             235                 240


Val Leu Pro Phe Ile Cys Thr Pro Thr Ala Gly Ser Thr Leu Ala Pro
            245             250                 255


Leu Tyr Trp Val Thr Pro Leu Leu Lys Arg Gln Tyr Leu Phe Asn Phe
            260             265                 270


Asn Glu Lys Gly Val Ile Thr Ser Ala Val Asp Cys Ala Ser Ser Tyr
        275             280                 285


Ile Ser Glu Ile Lys Cys Lys Thr Gln Ser Leu Leu Pro Ser Thr Gly
        290             295                 300


Val Tyr Asp Leu Ser Gly Tyr Thr Val Gln Pro Val Gly Val Val Tyr
305             310             315                 320


Arg Arg Val Pro Asn Leu Pro Asp Cys Lys Ile Glu Glu Trp Leu Thr
            325             330                 335


Ala Lys Ser Val Pro Ser Pro Leu Asn Trp Glu Arg Arg Thr Phe Gln
            340             345                 350


Asn Cys Asn Phe Asn Leu Ser Ser Leu Leu Arg Tyr Val Gln Ala Glu
        355             360                 365


Ser Leu Ser Cys Asn Asn Ile Asp Ala Ser Lys Val Tyr Gly Met Cys
        370             375                 380


Phe Gly Ser Val Ser Val Asp Lys Phe Ala Ile Pro Arg Ser Arg Gln
385             390             395                 400


Ile Asp Leu Gln Ile Gly Asn Ser Gly Phe Leu Gln Thr Ala Asn Tyr
            405             410                 415


Lys Ile Asp Thr Ala Ala Thr Ser Cys Gln Leu Tyr Tyr Ser Leu Pro
            420             425                 430


Lys Asn Asn Val Thr Ile Asn Asn Tyr Asn Pro Ser Ser Trp Asn Arg
            435             440                 445
```

Arg Tyr Gly Phe Lys Val Asn Asp Arg Cys Gln Ile Phe Ala Asn Ile
    450   455   460

Leu Leu Asn Gly Ile Asn Ser Gly Thr Thr Cys Ser Thr Asp Leu Gln
465   470   475   480

Leu Pro Asn Thr Glu Val Ala Thr Gly Val Cys Val Arg Tyr Asp Leu
              485   490   495

Tyr Gly Ile Thr Gly Gln Gly Val Phe Lys Glu Val Lys Ala Asp Tyr
        500   505   510

Tyr Asn Ser Trp Gln Ala Leu Leu Tyr Asp Val Asn Gly Asn Leu Asn
        515   520   525

Gly Phe Arg Asp Leu Thr Thr Asn Lys Thr Tyr Thr Ile Arg Ser Cys
    530   535   540

Tyr Ser Gly Arg Val Ser Ala Ala Tyr His Lys Glu Ala Pro Glu Pro
545   550   555   560

Ala Leu Leu Tyr Arg Asn Ile Asn Cys Ser Tyr Val Phe Thr Asn Asn
            565   570   575

Ile Ser Arg Glu Glu Asn Pro Leu Asn Tyr Phe Asp Ser Tyr Leu Gly
            580   585   590

Cys Val Val Asn Ala Asp Asn Arg Thr Asp Glu Ala Leu Pro Asn Cys
        595   600   605

Asn Leu Arg Met Gly Ala Gly Leu Cys Val Asp Tyr Ser Lys Ser Arg
    610   615   620

Arg Ala Arg Arg Ser Val Ser Thr Gly Tyr Arg Leu Thr Thr Phe Glu
625   630   635   640

Pro Tyr Met Pro Met Leu Val Asn Asp Ser Val Gln Ser Val Gly Gly
            645   650   655

Leu Tyr Glu Met Gln Ile Pro Thr Asn Phe Thr Ile Gly His His Glu
            660   665   670

Glu Phe Ile Gln Ile Arg Ala Pro Lys Val Thr Ile Asp Cys Ala Ala
        675   680   685

Phe Val Cys Gly Asp Asn Ala Ala Cys Arg Gln Gln Leu Val Glu Tyr
    690   695   700

Gly Ser Phe Cys Asp Asn Val Asn Ala Ile Leu Asn Glu Val Asn Asn
705   710   715   720

Leu Leu Asp Asn Met Gln Leu Gln Val Ala Ser Ala Leu Met Gln Gly
                725   730   735

Val Thr Ile Ser Ser Arg Leu Pro Asp Gly Ile Ser Gly Pro Ile Asp
                740   745   750

Asp Ile Asn Phe Ser Pro Leu Leu Gly Cys Ile Gly Ser Thr Cys Ala
                755   760   765

Glu Asp Gly Asn Gly Pro Ser Ala Ile Arg Gly Arg Ser Ala Ile Glu
    770   775   780

Asp Leu Leu Phe Asp Lys Val Lys Leu Ser Asp Val Gly Phe Val Glu
785   790   795   800

Ala Tyr Asn Asn Cys Thr Gly Gly Gln Glu Val Arg Asp Leu Leu Cys
                805   810   815

Val Gln Ser Phe Asn Gly Ile Lys Val Leu Pro Pro Val Leu Ser Glu
                820   825   830

Ser Gln Ile Ser Gly Tyr Thr Ala Gly Ala Thr Ala Ala Ala Met Phe
            835   840   845

Pro Pro Trp Thr Ala Ala Ala Gly Val Pro Phe Ser Leu Asn Val Gln
    850   855   860

Tyr Arg Ile Asn Gly Leu Gly Val Thr Met Asn Val Leu Ser Glu Asn
865   870   875   880

Gln Lys Met Ile Ala Ser Ala Phe Asn Asn Ala Leu Gly Ala Ile Gln
                885   890   895

Glu Gly Phe Asp Ala Thr Asn Ser Ala Leu Gly Lys Ile Gln Ser Val
                900   905   910

Val Asn Ala Asn Ala Glu Ala Leu Asn Asn Leu Leu Asn Gln Leu Ser
            915   920   925

Asn Arg Phe Gly Ala Ile Ser Ala Ser Leu Gln Glu Ile Leu Thr Arg
    930   935   940

Leu Asp Ala Val Glu Ala Lys Ala Gln Ile Asp Arg Leu Ile Asn Gly
                        Page 115

945   950   955   960

Arg Leu Thr Ala Leu Asn Ala Tyr Ile Ser Lys Gln Leu Ser Asp Ser
                965   970   975

Thr Leu Ile Lys Phe Ser Ala Ala Gln Ala Ile Glu Lys Val Asn Glu
                980   985   990

Cys Val Lys Ser Gln Thr Thr Arg Ile Asn Phe Cys Gly Asn Gly Asn
                995   1000   1005

His Ile Leu Ser Leu Val Gln Asn Ala Pro Tyr Gly Leu Cys Phe
    1010   1015   1020

Ile His Phe Ser Tyr Val Pro Thr Ser Phe Lys Thr Ala Asn Val
    1025   1030   1035

Ser Pro Gly Leu Cys Ile Ser Gly Asp Arg Gly Leu Ala Pro Lys
    1040   1045   1050

Ala Gly Tyr Phe Val Gln Asp Asn Gly Glu Trp Lys Phe Thr Gly
    1055   1060   1065

Ser Asn Tyr Tyr Tyr Pro Glu Pro Ile Thr Asp Lys Asn Ser Val
    1070   1075   1080

Ala Met Ile Ser Cys Ala Val Asn Tyr Thr Lys Ala Pro Glu Val
    1085   1090   1095

Phe Leu Asn Asn Ser Ile Pro Asn Leu Pro Asp Phe Lys Glu Glu
    1100   1105   1110

Leu Asp Lys Trp Phe Lys Asn Gln Thr Ser Ile Ala Pro Asp Leu
    1115   1120   1125

Ser Leu Asp Phe Glu Lys Leu Asn Val Thr Phe Leu Asp Leu Thr
    1130   1135   1140

Tyr Glu Met Asn Arg Ile Gln Asp Ala Ile Lys Lys Leu Asn Glu
    1145   1150   1155

Ser Tyr Ile Asn Leu Lys Glu Val Gly Thr Tyr Glu Met Tyr Val
    1160   1165   1170

Lys Trp Pro Trp Tyr Val Trp Leu Leu Ile Gly Leu Ala Gly Val
    1175   1180   1185

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```
Ala Val  Cys Val Leu Leu Phe  Phe Ile Cys Cys Cys  Thr Gly Cys
    1190              1195          1200
```

```
Gly Ser  Cys Cys Phe Arg Lys  Cys Gly Ser Cys Cys  Asp Glu Tyr
    1205              1210          1215
```

```
Gly Gly  His Gln Asp Ser Ile  Val Ile His Asn Ile  Ser Ala His
    1220              1225          1230
```

```
Glu Asp
    1235
```

<210> 58
<211> 1363
<212> PRT
<213> human coronavirus

<400> 58

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Met Phe Leu Ile Leu Leu Ile Ser Leu Pro Met Ala Leu Ala Val Ile
1               5               10              15
```

```
Gly Asp Leu Lys Cys Thr Thr Val Ala Ile Asn Asp Val Asp Thr Gly
            20              25              30
```

```
Val Pro Ser Thr Ser Thr Asp Ile Val Asp Val Thr Asn Gly Leu Gly
            35              40              45
```

```
Thr Tyr Tyr Val Leu Asp Arg Val Tyr Leu Asn Thr Thr Leu Leu Leu
    50              55              60
```

```
Asn Gly Tyr Tyr Pro Thr Ser Gly Ser Thr Tyr Arg Asn Met Ala Leu
65              70              75              80
```

```
Lys Gly Thr Leu Leu Leu Ser Arg Leu Trp Phe Lys Pro Pro Phe Leu
            85              90              95
```

```
Ser Asp Phe Ile Asn Gly Ile Phe Ala Lys Val Lys Asn Thr Lys Val
            100             105             110
```

```
Ile Lys His Gly Val Met Tyr Ser Glu Phe Pro Ala Ile Thr Ile Gly
            115             120             125
```

```
Ser Thr Phe Val Asn Thr Ser Tyr Ser Val Val Val Gln Pro His Thr
    130             135             140
```

```
Thr Asn Leu Asp Asn Lys Leu Gln Gly Leu Leu Glu Ile Ser Val Cys
145             150             155             160
```

```
Gln Tyr Thr Met Cys Glu Tyr Pro Asn Thr Ile Cys His Pro Asn Leu
            165             170             175

Gly Asn Arg Arg Val Glu Leu Trp His Trp Asp Thr Gly Val Val Ser
            180             185             190

Cys Leu Tyr Lys Arg Asn Phe Thr Tyr Asp Val Asn Ala Asp Tyr Leu
            195             200             205

Tyr Phe His Phe Tyr Gln Glu Gly Gly Ile Phe Tyr Ala Tyr Phe Thr
    210             215             220

Asp Thr Gly Val Val Thr Lys Phe Leu Phe Asn Val Tyr Leu Gly Thr
225             230             235             240

Val Leu Ser Tyr Tyr Tyr Val Met Pro Leu Thr Cys Asn Ser Ala Met
            245             250             255

Thr Leu Glu Tyr Trp Val Thr Pro Leu Thr Ser Lys Gln Tyr Leu Leu
            260             265             270

Ala Phe Asn Gln Asp Gly Val Ile Phe Asn Ala Val Asp Cys Lys Ser
            275             280             285

Asp Phe Met Ser Glu Ile Lys Cys Lys Thr Leu Ser Ile Ala Pro Ser
    290             295             300

Thr Gly Val Tyr Glu Leu Asn Gly Tyr Thr Val Gln Pro Ile Ala Asp
305             310             315             320

Val Tyr Arg Arg Ile Pro Asn Leu Pro Asp Cys Asn Ile Glu Ala Trp
            325             330             335

Leu Asn Asp Lys Ser Val Pro Ser Pro Leu Asn Trp Glu Arg Lys Thr
            340             345             350

Phe Ser Asn Cys Asn Phe Asn Met Ser Ser Leu Met Ser Phe Ile Gln
            355             360             365

Ala Asp Ser Phe Thr Cys Asn Asn Ile Asp Ala Ala Lys Ile Tyr Gly
    370             375             380

Met Cys Phe Ser Ser Ile Thr Ile Asp Lys Phe Ala Ile Pro Asn Gly
385             390             395             400

Arg Lys Val Asp Leu Gln Leu Gly Asn Leu Gly Tyr Leu Gln Ser Phe
            405             410             415
```

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```
Asn Tyr Arg Ile Asp Thr Thr Ala Thr Ser Cys Gln Leu Tyr Tyr Asn
            420             425             430
```

```
Leu Pro Ala Ala Asn Val Ser Val Ser Arg Phe Asn Pro Ser Ile Trp
        435             440             445
```

```
Asn Arg Arg Phe Gly Phe Thr Glu Gln Ser Val Phe Lys Pro Gln Pro
    450             455             460
```

```
Ala Gly Val Phe Thr Asp His Asp Val Val Tyr Ala Gln His Cys Phe
465             470             475             480
```

```
Lys Ala Pro Thr Asn Phe Cys Pro Cys Lys Leu Asp Gly Ser Leu Cys
            485             490             495
```

```
Val Gly Asn Gly Pro Gly Ile Asp Ala Gly Tyr Lys Asn Ser Gly Ile
            500             505             510
```

```
Gly Thr Cys Pro Ala Gly Thr Asn Tyr Leu Thr Cys His Asn Ala Val
        515             520             525
```

```
Gln Cys Asn Cys Leu Cys Thr Pro Asp Pro Ile Thr Ser Lys Ser Thr
    530             535             540
```

```
Gly Pro Tyr Lys Cys Pro Gln Thr Lys Tyr Leu Val Gly Ile Gly Glu
545             550             555             560
```

```
His Cys Ser Gly Leu Ala Ile Lys Ser Asp Tyr Cys Gly Gly Asn Pro
            565             570             575
```

```
Cys Thr Cys Gln Pro Gln Ala Phe Leu Gly Trp Ser Val Asp Ser Cys
        580             585             590
```

```
Leu Gln Gly Asp Arg Cys Asn Ile Phe Ala Asn Phe Ile Leu His Asp
        595             600             605
```

```
Val Asn Ser Gly Thr Thr Cys Ser Thr Asp Leu Gln Lys Ser Asn Thr
    610             615             620
```

```
Asp Ile Ile Leu Gly Val Cys Val Asn Tyr Asp Leu Tyr Gly Ile Thr
625             630             635             640
```

```
Gly Gln Gly Ile Phe Val Glu Val Asn Ala Pro Tyr Tyr Asn Ser Trp
            645             650             655
```

```
Gln Asn Leu Leu Tyr Asp Ser Asn Gly Asn Leu Tyr Gly Phe Arg Asp
            660             665             670
```

Tyr Leu Thr Asn Arg Thr Phe Met Ile Arg Ser Cys Tyr Ser Gly Arg
        675   680   685

Val Ser Ala Ala Phe His Ala Asn Ser Ser Glu Pro Ala Leu Leu Phe
    690   695   700

Arg Asn Ile Lys Cys Asn Tyr Val Phe Asn Asn Thr Leu Ser Arg Gln
705   710   715   720

Leu Gln Pro Ile Asn Tyr Phe Asp Ser Tyr Leu Gly Cys Val Val Asn
            725   730   735

Ala Asp Asn Ser Thr Ala Ser Ala Val Gln Thr Cys Asp Leu Thr Val
            740   745   750

Gly Ser Gly Tyr Cys Val Asp Tyr Ser Thr Lys Arg Arg Ser Arg Arg
        755   760   765

Ala Ile Thr Thr Gly Tyr Arg Phe Thr Asn Phe Glu Pro Phe Thr Val
    770   775   780

Asn Ser Val Asn Asp Ser Leu Glu His Val Gly Gly Leu Tyr Glu Ile
785   790   795   800

Gln Ile Pro Ser Glu Phe Thr Ile Gly Asn Met Glu Glu Phe Ile Gln
            805   810   815

Thr Ser Ser Pro Lys Val Thr Ile Asp Cys Ser Ala Phe Val Cys Gly
            820   825   830

Asp Cys Ala Ala Cys Lys Ser Gln Leu Val Glu Tyr Gly Ser Phe Cys
        835   840   845

Asp Asn Ile Asn Ala Ile Leu Thr Glu Val Asn Glu Leu Leu Asp Thr
    850   855   860

Thr Gln Leu Gln Val Ala Asn Ser Leu Met Asn Gly Val Thr Leu Ser
865   870   875   880

Thr Lys Leu Lys Asp Gly Val Asn Phe Asn Val Asp Asp Val Asn Phe
            885   890   895

Ser Pro Val Leu Gly Cys Leu Gly Ser Glu Cys Asn Lys Val Ser Ser
        900   905   910

Arg Ser Ala Ile Glu Asp Leu Leu Phe Ser Lys Val Arg Leu Ser Asp
                        Page 120

915   920   925

Val Gly Phe Val Glu Ala Tyr Asn Asn Cys Thr Gly Gly Ala Gly Ile
    930   935   940

Arg Asp Leu Ile Cys Val Gln Ser Tyr Asn Gly Ile Lys Val Leu Pro
945   950   955   960

Pro Leu Leu Ser Asp Asn Gln Ile Ser Gly Tyr Thr Leu Ala Ala Thr
              965   970   975

Ser Ala Asn Leu Phe Pro Pro Trp Ser Ala Ala Ala Gly Val Pro Phe
              980   985   990

Tyr Leu Asn Val Gln Tyr Arg Ile Asn Gly Ile Gly Val Thr Met Asp
         995   1000   1005

Val Leu Ser Gln Asn Gln Lys Leu Ile Ala Asn Ala Phe Asn Asn
    1010   1015   1020

Ala Leu Asp Ala Ile Gln Glu Gly Phe Asp Ala Thr Asn Ser Ala
    1025   1030   1035

Leu Val Lys Ile Gln Ala Val Val Asn Ala Asp Ala Glu Ala Leu
    1040   1045   1050

Asn Asn Leu Leu Gln Gln Leu Ser Asn Arg Phe Gly Ala Ile Ser
    1055   1060   1065

Ser Ser Leu Gln Glu Ile Leu Ser Arg Leu Asp Ala Leu Glu Ala
    1070   1075   1080

Gln Ala Gln Ile Asp Arg Leu Ile Asn Gly Arg Leu Thr Ala Leu
    1085   1090   1095

Asp Ala Tyr Val Ser Gln Gln Leu Ser Asp Ser Thr Leu Val Lys
    1100   1105   1110

Phe Ser Ala Ala Gln Ala Met Glu Lys Val Asn Glu Cys Val Lys
    1115   1120   1125

Ser Gln Ser Ser Arg Ile Asn Phe Cys Gly Asn Gly Asn His Ile
    1130   1135   1140

Ile Ser Leu Val Gln Asn Ala Pro Tyr Gly Leu Tyr Phe Ile His
    1145   1150   1155

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```
Phe Ser Tyr Val Pro Thr Lys Tyr Val Thr Ala Lys Val Ser Pro
    1160             1165             1170


Gly Leu Cys Ile Ala Gly Asp Arg Gly Ile Ala Pro Lys Ser Gly
    1175             1180             1185


Tyr Phe Val Asn Val Asn Asn Thr Trp Met Phe Thr Gly Ser Arg
    1190             1195             1200


Tyr Tyr Tyr Pro Glu Pro Ile Thr Gly Asn Asn Val Val Val Met
    1205             1210             1215


Ser Thr Cys Ala Val Asn Tyr Thr Lys Ala Pro Asp Val Met Leu
    1220             1225             1230


Asn Ile Ser Thr Pro Asn Leu Pro Asp Phe Lys Glu Glu Leu Asp
    1235             1240             1245


Gln Trp Phe Lys Asn Gln Thr Leu Val Ala Pro Asp Leu Ser Leu
    1250             1255             1260


Asp Tyr Ile Asn Val Thr Phe Leu Asp Leu Gln Asp Glu Met Asn
    1265             1270             1275


Arg Leu Gln Glu Ala Ile Lys Val Leu Asn Gln Ser Tyr Ile Asn
    1280             1285             1290


Leu Lys Asp Ile Gly Thr Tyr Glu Tyr Tyr Val Lys Trp Pro Trp
    1295             1300             1305


Tyr Val Trp Leu Leu Ile Gly Phe Ala Gly Val Ala Met Leu Val
    1310             1315             1320


Leu Leu Phe Phe Ile Cys Cys Cys Thr Gly Cys Gly Thr Ser Cys
    1325             1330             1335


Phe Lys Lys Cys Gly Gly Cys Cys Asp Asp Tyr Thr Gly His Gln
    1340             1345             1350


Glu Leu Val Ile Lys Thr Ser His Glu Gly
    1355             1360
```

```
<210>   59
<211>   1383
<212>   PRT
<213>   Porcine epidemic diarrhea virus

<400>   59
```

```
Met Arg Ser Leu Ile Tyr Phe Trp Leu Leu Leu Pro Val Leu Pro Thr
1               5                10                15

Leu Ser Leu Pro Gln Asp Val Thr Arg Cys Gln Ser Thr Thr Asn Phe
            20              25              30

Arg Arg Phe Phe Ser Lys Phe Asn Val Gln Ala Pro Ala Val Val Val
        35              40              45

Leu Gly Gly Tyr Leu Pro Ser Met Asn Ser Ser Ser Trp Tyr Cys Gly
    50              55              60

Thr Gly Ile Glu Thr Ala Ser Gly Val His Gly Ile Phe Leu Ser Tyr
65              70              75              80

Ile Asp Ser Gly Gln Gly Phe Glu Ile Gly Ile Ser Gln Glu Pro Phe
            85              90              95

Asp Pro Ser Gly Tyr Gln Leu Tyr Leu His Lys Ala Thr Asn Gly Asn
            100             105             110

Thr Asn Ala Thr Ala Arg Leu Arg Ile Cys Gln Phe Pro Asp Asn Lys
        115             120             125

Thr Leu Gly Pro Thr Val Asn Asp Val Thr Thr Gly Arg Asn Cys Leu
    130             135             140

Phe Asn Lys Ala Ile Pro Ala Tyr Met Arg Asp Gly Lys Asp Ile Val
145             150             155             160

Val Gly Ile Thr Trp Asp Asn Asp Arg Val Thr Val Phe Ala Asp Lys
            165             170             175

Ile Tyr His Phe Tyr Leu Lys Asn Asp Trp Ser Arg Val Ala Thr Arg
            180             185             190

Cys Tyr Asn Arg Arg Ser Cys Ala Met Gln Tyr Val Tyr Thr Pro Thr
        195             200             205

Tyr Tyr Met Leu Asn Val Thr Ser Ala Gly Glu Asp Gly Ile Tyr Tyr
    210             215             220

Glu Pro Cys Thr Ala Asn Cys Thr Gly Tyr Ala Ala Asn Val Phe Ala
225             230             235             240

Thr Asp Ser Asn Gly His Ile Pro Glu Gly Phe Ser Phe Asn Asn Trp
            245             250             255
```

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Phe Leu Leu Ser Asn Asp Ser Thr Leu Leu His Gly Lys Val Val Ser
         260   265   270

Asn Gln Pro Leu Leu Val Asn Cys Leu Leu Ala Ile Pro Lys Ile Tyr
     275   280   285

Gly Leu Gly Gln Phe Phe Ser Phe Asn His Thr Met Asp Gly Val Cys
     290   295   300

Asn Gly Ala Ala Val Asp Arg Ala Pro Glu Ala Leu Arg Phe Asn Ile
305   310   315   320

Asn Asp Thr Ser Val Ile Leu Ala Glu Gly Ser Ile Val Leu His Thr
         325   330   335

Ala Leu Gly Thr Asn Leu Ser Phe Val Cys Ser Asn Ser Ser Asp Pro
     340   345   350

His Leu Ala Ile Phe Ala Ile Pro Leu Gly Ala Thr Glu Val Pro Tyr
     355   360   365

Tyr Cys Phe Leu Lys Val Asp Thr Tyr Asn Ser Thr Val Tyr Lys Phe
     370   375   380

Leu Ala Val Leu Pro Ser Thr Val Arg Glu Ile Val Ile Thr Lys Tyr
385   390   395   400

Gly Asp Val Tyr Val Asn Gly Phe Gly Tyr Leu His Leu Gly Leu Leu
     405   410   415

Asp Ala Val Thr Ile Tyr Phe Thr Gly His Gly Thr Asp Asp Asp Val
     420   425   430

Ser Gly Phe Trp Thr Ile Ala Ser Thr Asn Phe Val Asp Ala Leu Ile
     435   440   445

Glu Val Gln Gly Thr Ser Ile Gln Arg Ile Leu Tyr Cys Asp Asp Pro
     450   455   460

Val Ser Gln Leu Lys Cys Ser Gln Val Ala Phe Asp Leu Asp Asp Gly
465   470   475   480

Phe Tyr Pro Ile Ser Ser Arg Asn Leu Leu Ser His Glu Gln Pro Ile
     485   490   495

Ser Phe Val Thr Leu Pro Ser Phe Asn Asp His Ser Phe Val Asn Ile
     500   505   510

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```
Thr Val Ser Ala Ala Phe Gly Gly Leu Ser Ser Ala Asn Leu Val Ala
    515             520             525

Ser Asp Thr Thr Ile Asn Gly Phe Ser Ser Phe Cys Val Asp Thr Arg
    530             535             540

Gln Phe Thr Ile Thr Leu Phe Tyr Asn Val Thr Asn Ser Tyr Gly Tyr
545             550             555             560

Val Ser Lys Ser Gln Asp Ser Asn Cys Pro Phe Thr Leu Gln Ser Val
            565             570             575

Asn Asp Tyr Leu Ser Phe Ser Lys Phe Cys Val Ser Thr Ser Leu Leu
            580             585             590

Ala Gly Ala Cys Thr Ile Asp Leu Phe Gly Tyr Pro Ala Phe Gly Ser
            595             600             605

Gly Val Lys Leu Thr Ser Leu Tyr Phe Gln Phe Thr Lys Gly Glu Leu
    610             615             620

Ile Thr Gly Thr Pro Lys Pro Leu Glu. Gly Ile Thr Asp Val Ser Phe
625             630             635             640

Met Thr Leu Asp Val Cys Thr Lys Tyr Thr Ile Tyr Gly Phe Lys Gly
            645             650             655

Glu Gly Ile Ile Thr Leu Thr Asn Ser Ser Ile Leu Ala Gly Val Tyr
            660             665             670

Tyr Thr Ser Asp Ser Gly Gln Leu Leu Ala Phe Lys Asn Val Thr Ser
    675             680             685

Gly Ala Val Tyr Ser Val Thr Pro Cys Ser Phe Ser Glu Gln Ala Ala
    690             695             700

Tyr Val Asn Asp Asp Ile Val Gly Val Ile Ser Ser Leu Ser Asn Ser
705             710             715             720

Thr Phe Asn Asn Thr Arg Glu Leu Pro Gly Phe Phe Tyr His Ser Asn
            725             730             735

Asp Gly Ser Asn Cys Thr Glu Pro Val Leu Val Tyr Ser Asn Ile Gly
            740             745             750

Val Cys Lys Ser Gly Ser Ile Gly Tyr Val Pro Ser Gln Tyr Gly Gln
```

Val Lys Ile Ala Pro Thr Val Thr Gly Asn Ile Ser Ile Pro Thr Asn
    770   775   780

Phe Ser Met Ser Ile Arg Thr Glu Tyr Leu Gln Leu Tyr Asn Thr Pro
785   790   795   800

Val Ser Val Asp Cys Ala Thr Tyr Val Cys Asn Gly Asn Ser Arg Cys
            805   810   815

Lys Gln Leu Leu Thr Gln Tyr Thr Ala Ala Cys Lys Thr Ile Glu Ser
        820   825   830

Ala Leu Gln Leu Ser Ala Arg Leu Glu Ser Val Glu Val Asn Ser Met
        835   840   845

Leu Thr Ile Ser Glu Glu Ala Leu Gln Leu Ala Thr Ile Ser Ser Phe
    850   855   860

Asn Gly Asp Gly Tyr Asn Phe Thr Asn Val Leu Gly Ala Ser Val Tyr
865   870   875   880

Asp Pro Ala Ser Gly Arg Val Val Gln Lys Arg Ser Val Ile Glu Asp
            885   890   895

Leu Leu Phe Asn Lys Val Val Thr Asn Gly Leu Gly Thr Val Asp Glu
        900   905   910

Asp Tyr Lys Arg Cys Ser Asn Gly Arg Ser Val Ala Asp Leu Val Cys
        915   920   925

Ala Gln Tyr Tyr Ser Gly Val Met Val Leu Pro Gly Val Val Asp Ala
    930   935   940

Glu Lys Leu His Met Tyr Ser Ala Ser Leu Ile Gly Gly Met Ala Leu
945   950   955   960

Gly Gly Ile Thr Ala Ala Ala Ala Leu Pro Phe Ser Tyr Ala Val Gln
            965   970   975

Ala Arg Leu Asn Tyr Leu Ala Leu Gln Thr Asp Val Leu Gln Arg Asn
        980   985   990

Gln Gln Leu Leu Ala Glu Ser Phe Asn Ser Ala Ile Gly Asn Ile Thr
    995   1000   1005

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Ser Ala Phe Glu Ser Val Lys Glu Ala Ile Ser Gln Thr Ser Lys
    1010   1015   1020

Gly Leu Asn Thr Val Ala His Ala Leu Thr Lys Val Gln Glu Val
    1025   1030   1035

Val Asn Ser Gln Gly Ser Ala Leu Asn Gln Leu Thr Val Gln Leu
    1040   1045   1050

Gln His Asn Phe Gln Ala Ile Ser Ser Ser Ile Asp Asp Ile Tyr
    1055   1060   1065

Ser Arg Leu Asp Ile Leu Leu Ala Asp Val Gln Val Asp Arg Leu
    1070   1075   1080

Ile Thr Gly Arg Leu Ser Ala Leu Asn Ala Phe Val Ala Gln Thr
    1085   1090   1095

Leu Thr Lys Tyr Thr Glu Val Gln Ala Ser Arg Lys Leu Ala Gln
    1100   1105   1110

Gln Lys Val Asn Glu Cys Val Lys Ser Gln Ser Gln Arg Tyr Gly
    1115   1120   1125

Phe Cys Gly Gly Asp Gly Glu His Ile Phe Ser Leu Val Gln Ala
    1130   1135   1140

Ala Pro Gln Gly Leu Leu Phe Leu His Thr Val Leu Val Pro Gly
    1145   1150   1155

Asp Phe Val Asn Val Leu Ala Ile Ala Gly Leu Cys Val Asn Gly
    1160   1165   1170

Glu Ile Ala Leu Thr Leu Arg Glu Pro Gly Leu Val Leu Phe Thr
    1175   1180   1185

His Glu Leu Gln Thr Tyr Thr Ala Thr Glu Tyr Phe Val Ser Ser
    1190   1195   1200

Arg Arg Met Phe Glu Pro Arg Lys Pro Thr Val Ser Asp Phe Val
    1205   1210   1215

Gln Ile Glu Ser Cys Val Val Thr Tyr Val Asn Leu Thr Ser Asp
    1220   1225   1230

Gln Leu Pro Asp Val Ile Pro Asp Tyr Ile Asp Val Asn Lys Thr
    1235   1240   1245

Leu Asp Glu Ile Leu Ala Ser Leu Pro Asn Arg Thr Gly Pro Ser
    1250   1255   1260

Leu Pro Leu Asp Val Phe Asn Ala Thr Tyr Leu Asn Leu Thr Gly
    1265   1270   1275

Glu Ile Ala Asp Leu Glu Gln Arg Ser Glu Ser Leu Arg Asn Thr
    1280   1285   1290

Thr Glu Glu Leu Arg Ser Leu Ile Asn Asn Ile Asn Asn Thr Leu
    1295   1300   1305

Val Asp Leu Glu Trp Leu Asn Arg Val Glu Thr Tyr Ile Lys Trp
    1310   1315   1320

Pro Trp Trp Val Trp Leu Ile Ile Val Ile Val Leu Ile Phe Val
    1325   1330   1335

Val Ser Leu Leu Val Phe Cys Cys Ile Ser Thr Gly Cys Cys Gly
    1340   1345   1350

Cys Cys Gly Cys Cys Gly Ala Cys Phe Ser Gly Cys Cys Arg Gly
    1355   1360   1365

Pro Arg Leu Gln Pro Tyr Glu Ala Phe Glu Lys Val His Val Gln
    1370   1375   1380

<210> 60
<211> 1349
<212> PRT
<213> porcine hemagglutinating encephalomyelitis virus

<400> 60

Met Phe Phe Ile Leu Leu Ile Ser Leu Pro Ser Ala Phe Ala Val Ile
1   5   10   15

Gly Asp Leu Lys Cys Thr Thr Ser Leu Ile Asn Asp Val Asp Thr Gly
        20   25   30

Val Pro Ser Ile Ser Ser Glu Val Val Asp Val Thr Asn Gly Leu Gly
        35   40   45

Thr Phe Tyr Val Leu Asp Arg Val Tyr Leu Asn Thr Thr Leu Leu Leu
    50   55   60

Asn Gly Tyr Tyr Pro Ile Ser Gly Ala Thr Phe Arg Asn Met Ala Leu
65   70   75   80

Lys Gly Thr Arg Leu Leu Ser Thr Leu Trp Phe Lys Pro Pro Phe Leu
                85   90   95

Ser Pro Phe Asn Asp Gly Ile Phe Ala Lys Val Lys Asn Ser Arg Phe
               100   105   110

Ser Lys Asp Gly Val Ile Tyr Ser Glu Phe Pro Ala Ile Thr Ile Gly
           115   120   125

Ser Thr Phe Val Asn Thr Ser Tyr Ser Ile Val Val Glu Pro His Thr
       130   135   140

Ser Leu Ile Asn Gly Asn Leu Gln Gly Leu Leu Gln Ile Ser Val Cys
145   150   155   160

Gln Tyr Thr Met Cys Glu Tyr Pro His Thr Ile Cys His Pro Asn Leu
               165   170   175

Gly Asn Gln Arg Ile Glu Leu Trp His Tyr Asp Thr Asp Val Val Ser
           180   185   190

Cys Leu Tyr Arg Arg Asn Phe Thr Tyr Asp Val Asn Ala Asp Tyr Leu
           195   200   205

Tyr Phe His Phe Tyr Gln Glu Gly Gly Thr Phe Tyr Ala Tyr Phe Thr
    210   215   220

Asp Thr Gly Phe Val Thr Lys Phe Leu Phe Lys Leu Tyr Leu Gly Thr
225   230   235   240

Val Leu Ser His Tyr Tyr Val Met Pro Leu Thr Cys Asn Ser Ala Leu
               245   250   255

Ser Leu Glu Tyr Trp Val Thr Pro Leu Thr Thr Arg Gln Phe Leu Leu
           260   265   270

Ala Phe Asp Gln Asp Gly Val Leu Tyr His Ala Val Asp Cys Ala Ser
       275   280   285

Asp Phe Met Ser Glu Ile Met Cys Lys Thr Ser Ser Ile Thr Pro Pro
    290   295   300

Thr Gly Val Tyr Glu Leu Asn Gly Tyr Thr Val Gln Pro Val Ala Thr
305   310   315   320

Val Tyr Arg Arg Ile Pro Asp Leu Pro Asn Cys Asp Ile Glu Ala Trp
           325   330   335
                        Page 129

Leu Asn Ser Lys Thr Val Ser Ser Pro Leu Asn Trp Glu Arg Lys Ile
            340   345   350

Phe Ser Asn Cys Asn Phe Asn Met Gly Arg Leu Met Ser Phe Ile Gln
        355   360   365

Ala Asp Ser Phe Gly Cys Asn Asn Ile Asp Ala Ser Arg Leu Tyr Gly
        370   375   380

Met Cys Phe Gly Ser Ile Thr Ile Asp Lys Phe Ala Ile Pro Asn Ser
385   390   395   400

Arg Lys Val Asp Leu Gln Val Gly Lys Ser Gly Tyr Leu Gln Ser Phe
            405   410   415

Asn Tyr Lys Ile Asp Thr Ala Val Ser Ser Cys Gln Leu Tyr Tyr Ser
            420   425   430

Leu Pro Ala Ala Asn Val Ser Val Thr His Tyr Asn Pro Ser Ser Trp
        435   440   445

Asn Arg Arg Tyr Gly Phe Asn Asn Gln Ser Phe Gly Ser Arg Gly Leu
    450   455   460

His Asp Ala Val Tyr Ser Gln Gln Cys Phe Asn Thr Pro Asn Thr Tyr
465   470   475   480

Cys Pro Cys Arg Thr Ser Gln Cys Ile Gly Gly Ala Gly Thr Gly Thr
            485   490   495

Cys Pro Val Gly Thr Thr Val Arg Lys Cys Phe Ala Ala Val Thr Lys
            500   505   510

Ala Thr Lys Cys Thr Cys Trp Cys Gln Pro Asp Pro Ser Thr Tyr Lys
        515   520   525

Gly Val Asn Ala Trp Thr Cys Pro Gln Ser Lys Val Ser Ile Gln Pro
    530   535   540

Gly Gln His Cys Pro Gly Leu Gly Leu Val Glu Asp Asp Cys Ser Gly
545   550   555   560

Asn Pro Cys Thr Cys Lys Pro Gln Ala Phe Ile Gly Trp Ser Ser Glu
            565   570   575

Thr Cys Leu Gln Asn Gly Arg Cys Asn Ile Phe Ala Asn Phe Ile Leu
                        Page 130

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              580                   585                   590


Asn Asp Val Asn Ser Gly Thr Thr Cys Ser Thr Asp Leu Gln Gln Gly
        595                   600                   605


Asn Thr Ile Ile Thr Thr Asp Val Cys Val Asn Tyr Asp Leu Tyr Gly
    610                   615                   620


Ile Thr Gly Gln Gly Ile Leu Ile Glu Val Asn Ala Thr Tyr Tyr Asn
625                   630                   635                   640


Ser Trp Gln Asn Leu Leu Tyr Asp Ser Ser Gly Asn Leu Tyr Gly Phe
            645                   650                   655


Arg Asp Tyr Leu Ser Asn Arg Thr Phe Leu Ile Arg Ser Cys Tyr Ser
            660                   665                   670


Gly Arg Val Ser Ala Val Phe His Ala Asn Ser Ser Glu Pro Ala Leu
        675                   680                   685


Met Phe Arg Asn Leu Lys Cys Ser His Val Phe Asn Asn Thr Ile Leu
    690                   695                   700


Arg Gln Ile Gln Leu Val Asn Tyr Phe Asp Ser Tyr Leu Gly Cys Val
705                   710                   715                   720


Val Asn Ala Tyr Asn Asn Thr Ala Ser Ala Val Ser Thr Cys Asp Leu
            725                   730                   735


Thr Val Gly Ser Gly Tyr Cys Val Asp Tyr Val Thr Ala Leu Arg Ser
            740                   745                   750


Arg Arg Ser Phe Thr Thr Gly Tyr Arg Phe Thr Asn Phe Glu Pro Phe
            755                   760                   765


Ala Ala Asn Leu Val Asn Asp Ser Ile Glu Pro Val Gly Gly Leu Tyr
    770                   775                   780


Glu Ile Gln Ile Pro Ser Glu Phe Thr Ile Gly Asn Leu Glu Glu Phe
785                   790                   795                   800


Ile Gln Thr Arg Ser Pro Lys Val Thr Ile Asp Cys Ala Thr Phe Val
            805                   810                   815


Cys Gly Asp Tyr Ala Ala Cys Arg Gln Gln Leu Ala Glu Tyr Gly Ser
            820                   825                   830


                          Page 131
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```
Phe Cys Glu Asn Ile Asn Ala Ile Leu Thr Glu Val Asn Glu Leu Leu
        835             840             845

Asp Thr Thr Gln Leu Gln Val Ala Asn Ser Leu Met Asn Gly Val Thr
    850             855             860

Leu Ser Thr Lys Ile Lys Asp Gly Ile Asn Phe Asn Val Asp Asp Ile
865             870             875             880

Asn Phe Ser Pro Val Leu Gly Cys Leu Gly Ser Glu Cys Asn Arg Ala
            885             890             895

Ser Thr Arg Ser Ala Ile Glu Asp Leu Leu Phe Asp Lys Val Lys Leu
        900             905             910

Ser Asp Val Gly Phe Val Gln Ala Tyr Asn Asn Cys Thr Gly Gly Ala
        915             920             925

Glu Ile Arg Asp Leu Ile Cys Val Gln Ser Tyr Asn Gly Ile Lys Val
    930             935             940

Leu Pro Pro Leu Leu Ser Glu Asn Gln Ile Ser Gly Tyr Thr Leu Ala
945             950             955             960

Ala Thr Ala Ala Ser Leu Phe Pro Pro Trp Thr Ala Ala Ala Gly Val
            965             970             975

Pro Phe Tyr Leu Asn Val Gln Tyr Arg Ile Asn Gly Leu Gly Val Thr
            980             985             990

Met Asp Val Leu Ser Gln Asn Gln  Lys Leu Ile Ala Ser  Ala Phe Asn
        995             1000            1005

Asn Ala  Leu Asp Ala Ile Gln  Glu Gly Phe Asp Ala  Thr Asn Ser
    1010            1015            1020

Ala Leu  Val Lys Ile Gln Ala  Val Val Asn Ala Asn  Ala Glu Ala
    1025            1030            1035

Leu Asn  Asn Leu Leu Gln Gln  Leu Ser Asn Arg Phe  Gly Ala Ile
    1040            1045            1050

Ser Ala  Ser Leu Gln Glu Ile  Leu Ser Arg Leu Asp  Ala Leu Glu
    1055            1060            1065

Ala Lys  Ala Gln Ile Asp Arg  Leu Ile Asn Gly Arg  Leu Thr Ala
    1070            1075            1080
```

Leu Asn Ala Tyr Val Ser Gln Gln Leu Ser Asp Ser Thr Leu Val
    1085   1090   1095

Lys Phe Ser Ala Ala Gln Ala Ile Glu Lys Val Asn Glu Cys Val
    1100   1105   1110

Lys Ser Gln Ser Ser Arg Ile Asn Phe Cys Gly Asn Gly Asn His
    1115   1120   1125

Ile Ile Ser Leu Val Gln Asn Ala Pro Tyr Gly Leu Tyr Phe Ile
    1130   1135   1140

His Phe Ser Tyr Val Pro Thr Lys Tyr Val Thr Ala Lys Val Ser
    1145   1150   1155

Pro Gly Leu Cys Ile Ala Gly Asp Ile Gly Ile Ser Pro Lys Ser
    1160   1165   1170

Gly Tyr Phe Ile Asn Val Asn Asn Ser Trp Met Phe Thr Gly Ser
    1175   1180   1185

Ser Tyr Tyr Tyr Pro Glu Pro Ile Thr Gln Asn Asn Val Val Val
    1190   1195   1200

Met Ser Thr Cys Ala Val Asn Tyr Thr Lys Ala Pro Asp Leu Met
    1205   1210   1215

Leu Asn Thr Ser Thr Pro Asn Leu Pro Asp Phe Lys Glu Glu Leu
    1220   1225   1230

Tyr Gln Trp Phe Lys Asn Gln Ser Ser Val Ala Pro Asp Leu Ser
    1235   1240   1245

Leu Asp Tyr Ile Asn Val Thr Phe Leu Asp Leu Gln Asp Glu Met
    1250   1255   1260

Asn Arg Leu Gln Glu Ala Ile Lys Val Leu Asn Gln Ser Tyr Ile
    1265   1270   1275

Asn Leu Lys Asp Ile Gly Thr Tyr Glu Tyr Tyr Val Lys Trp Pro
    1280   1285   1290

Trp Tyr Val Trp Leu Leu Ile Gly Leu Ala Gly Val Ala Met Leu
    1295   1300   1305

Val Leu Leu Phe Phe Ile Cys Cys Cys Thr Gly Cys Gly Thr Ser
    1310   1315   1320

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```
Cys Phe  Lys Lys Cys Gly Gly  Cys Cys Asp Asp Tyr  Thr Gly His
    1325             1330              1335


Gln Glu  Phe Val Ile Lys Thr  Ser His Asp Asp
    1340             1345
```

<210> 61
<211> 1225
<212> PRT
<213> Porcine respiratory coronavirus

<400> 61

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Met Lys Lys Leu Phe Val Val Leu Val Val Met Pro Leu Ile Tyr Gly
1             5              10              15


Asp Lys Phe Pro Thr Ser Val Val Ser Asn Cys Thr Asp Gln Cys Ala
            20              25              30


Ser Tyr Val Ala Asn Val Phe Thr Thr Gln Pro Gly Gly Phe Ile Pro
        35              40              45


Ser Asp Phe Ser Phe Asn Asn Trp Phe Leu Leu Thr Asn Ser Ser Thr
    50              55              60


Leu Val Ser Gly Lys Leu Val Thr Lys Gln Pro Leu Leu Val Asn Cys
65              70              75              80


Leu Trp Pro Val Pro Ser Phe Glu Glu Ala Ala Ser Thr Phe Cys Phe
            85              90              95


Glu Gly Ala Asp Phe Asp Gln Cys Asn Gly Ala Val Leu Asn Asn Thr
            100             105             110


Val Asp Val Ile Arg Phe Asn Leu Asn Phe Thr Thr Asn Val Gln Ser
        115             120             125


Gly Lys Gly Ala Thr Val Phe Ser Leu Asn Thr Thr Gly Gly Val Thr
    130             135             140


Leu Glu Ile Ser Cys Tyr Asn Asp Thr Val Ser Asp Ser Ser Phe Ser
145             150             155             160


Ser Tyr Gly Glu Ile Pro Phe Gly Val Thr Asn Gly Pro Arg Tyr Cys
            165             170             175


Tyr Val Leu Tyr Asn Gly Thr Ala Leu Lys Tyr Leu Gly Thr Leu Pro
            180             185             190
```

Pro Ser Val Lys Glu Ile Ala Ile Ser Lys Trp Gly His Phe Tyr Ile
        195   200   205

Asn Gly Tyr Asn Phe Phe Ser Thr Phe Pro Ile Asp Cys Ile Ser Phe
    210   215   220

Asn Leu Thr Thr Gly Asp Ser Asp Val Phe Trp Thr Ile Ala Tyr Thr
225   230   235   240

Ser Tyr Thr Glu Ala Leu Val Gln Val Glu Asn Thr Ala Ile Thr Asn
        245   250   255

Val Thr Tyr Cys Asn Ser Tyr Val Asn Asn Ile Lys Cys Ser Gln Leu
        260   265   270

Thr Ala Asn Leu Asn Asn Gly Phe Tyr Pro Val Ser Ser Ser Glu Val
        275   280   285

Gly Ser Val Asn Lys Ser Val Val Leu Leu Pro Ser Phe Leu Thr His
    290   295   300

Thr Ile Val Asn Ile Thr Ile Gly Leu Gly Met Lys Arg Ser Gly Tyr
305   310   315   320

Gly Gln Pro Ile Ala Ser Thr Leu Ser Asn Ile Thr Leu Pro Met Gln
        325   330   335

Asp Asn Asn Thr Asp Val Tyr Cys Val Arg Ser Asp Gln Phe Ser Val
        340   345   350

Tyr Val His Ser Thr Cys Lys Ser Ala Leu Trp Asp Asn Val Phe Lys
        355   360   365

Arg Asn Cys Thr Asp Val Leu Asp Ala Thr Ala Val Ile Lys Thr Gly
    370   375   380

Thr Cys Pro Phe Ser Phe Asp Lys Leu Asn Asn Tyr Leu Thr Phe Asn
385   390   395   400

Lys Phe Cys Leu Ser Leu Ser Pro Val Gly Ala Asn Cys Lys Phe Asp
            405   410   415

Val Ala Ala Arg Thr Arg Thr Asn Glu Gln Val Val Arg Ser Leu Tyr
        420   425   430

Val Ile Tyr Glu Glu Gly Asp Ser Ile Val Gly Val Pro Ser Asp Asn

                435   440   445

Ser Gly Leu His Asp Leu Ser Val Leu His Leu Asp Ser Cys Thr Asp
    450   455   460

Tyr Asn Ile Tyr Gly Arg Thr Gly Val Gly Ile Ile Arg Gln Thr Asn
465   470   475   480

Arg Thr Leu Leu Ser Gly Leu Tyr Tyr Thr Ser Leu Ser Gly Asp Leu
                485   490   495

Leu Gly Phe Lys Asn Val Ser Asp Gly Val Ile Tyr Ser Val Thr Pro
            500   505   510

Cys Asp Val Ser Ala Gln Ala Ala Val Ile Asp Gly Thr Ile Val Gly
            515   520   525

Ala Ile Thr Ser Ile Asn Ser Glu Leu Leu Gly Leu Thr His Trp Thr
    530   535   540

Ile Thr Pro Asn Phe Tyr Tyr Tyr Ser Ile Tyr Asn Tyr Thr Asn Asp
545   550   555   560

Lys Thr Arg Gly Thr Pro Ile Asp Ser Asn Asp Val Gly Cys Glu Pro
                565   570   575

Val Ile Thr Tyr Ser Asn Ile Gly Val Cys Lys Asn Gly Ala Leu Val
            580   585   590

Phe Ile Asn Val Thr His Ser Asp Gly Asp Val Gln Pro Ile Ser Thr
        595   600   605

Gly Asn Val Thr Ile Pro Thr Asn Phe Thr Ile Ser Val Gln Val Glu
    610   615   620

Tyr Ile Gln Val Tyr Thr Thr Pro Val Ser Ile Asp Cys Ser Arg Tyr
625   630   635   640

Val Cys Asn Gly Asn Pro Arg Cys Asn Lys Leu Leu Thr Gln Tyr Val
                645   650   655

Ser Ala Cys Gln Thr Ile Glu Gln Ala Leu Ala Met Gly Ala Arg Leu
            660   665   670

Glu Asn Met Glu Val Asp Ser Met Leu Phe Val Ser Glu Asn Ala Leu
            675   680   685

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Lys Leu Ala Ser Val Glu Ala Phe Asn Ser Ser Glu Thr Leu Asp Pro
690   695   700

Ile Tyr Thr Gln Trp Pro Asn Ile Gly Gly Phe Trp Leu Glu Gly Leu
705   710   715   720

Lys Tyr Ile Leu Pro Ser Asp Asn Ser Lys Arg Lys Tyr Arg Ser Ala
                725   730   735

Ile Glu Asp Leu Leu Phe Ser Lys Val Val Thr Ser Gly Leu Gly Thr
            740   745   750

Val Asp Glu Asp Tyr Lys Arg Cys Thr Gly Gly Tyr Asp Ile Ala Asp
        755   760   765

Leu Val Cys Ala Gln Tyr Tyr Asn Gly Ile Met Val Leu Pro Gly Val
    770   775   780

Ala Asn Ala Asp Lys Met Thr Met Tyr Thr Ala Ser Leu Ala Gly Gly
785   790   795   800

Ile Thr Leu Gly Ala Phe Gly Gly Gly Ala Val Ser Ile Pro Phe Ala
            805   810   815

Val Ala Val Gln Ala Arg Leu Asn Tyr Val Ala Leu Gln Thr Asp Val
            820   825   830

Leu Asn Lys Asn Gln Gln Ile Leu Ala Ser Ala Phe Asn Gln Ala Ile
        835   840   845

Gly Asn Ile Thr Gln Ser Phe Gly Lys Val Asn Asp Ala Ile His Gln
    850   855   860

Thr Ser Arg Gly Leu Thr Thr Val Ala Lys Ala Leu Ala Lys Val Gln
865   870   875   880

Asp Val Val Asn Thr Gln Gly Gln Ala Leu Arg His Leu Thr Val Gln
            885   890   895

Leu Gln Asn Asn Phe Gln Ala Ile Ser Ser Ser Ile Ser Asp Ile Tyr
        900   905   910

Asn Arg Leu Asp Glu Leu Ser Ala Asp Ala Gln Val Asp Arg Leu Ile
    915   920   925

Thr Gly Arg Leu Thr Ala Leu Asn Ala Phe Val Ser Gln Thr Leu Thr
    930   935   940

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```
Arg Gln Ala Glu Val Arg Ala Ser Arg Gln Leu Ala Lys Asp Lys Val
945             950             955             960

Asn Glu Cys Val Arg Ser Gln Ser Gln Arg Phe Gly Phe Cys Gly Asn
                965             970             975

Gly Thr His Leu Phe Ser Leu Ala Asn Ala Ala Pro Asn Gly Met Ile
            980             985             990

Phe Phe His Thr Val Leu Leu Pro  Thr Ala Tyr Glu Thr  Val Thr Ala
        995             1000            1005

Trp Ser  Gly Ile Cys Ala Leu  Asp Gly Asp Arg Thr  Phe Gly Leu
    1010            1015            1020

Val Val  Lys Asp Val Gln Leu  Thr Leu Phe Arg Asn  Leu Asp Asp
    1025            1030            1035

Lys Phe  Tyr Leu Thr Pro Arg  Thr Met Tyr Gln Pro  Arg Val Ala
    1040            1045            1050

Thr Ser  Ser Asp Phe Val Gln  Ile Glu Gly Cys Asp  Val Leu Phe
    1055            1060            1065

Val Asn  Thr Thr Val Ser Asp  Leu Pro Ser Ile Ile  Pro Asp Tyr
    1070            1075            1080

Ile Asp  Ile Asn Gln Thr Val  Gln Asp Ile Leu Glu  Asn Phe Arg
    1085            1090            1095

Pro Asn  Trp Thr Val Pro Glu  Leu Thr Leu Asp Val  Phe Asn Ala
    1100            1105            1110

Thr Tyr  Leu Asn Leu Thr Gly  Glu Ile Asp Asp Leu  Glu Phe Arg
    1115            1120            1125

Ser Glu  Lys Leu His Asn Thr  Thr Val Glu Leu Ala  Ile Leu Ile
    1130            1135            1140

Asp Asn  Ile Asn Asn Thr Leu  Val Asn Leu Glu Trp  Leu Asn Arg
    1145            1150            1155

Ile Glu  Thr Tyr Val Lys Trp  Pro Trp Tyr Val Trp  Leu Leu Ile
    1160            1165            1170

Gly Leu  Val Val Ile Phe Cys  Ile Pro Leu Leu Leu  Phe Cys Cys
    1175            1180            1185
```

```
Cys Ser  Thr Gly Cys Cys Gly  Cys Ile Gly Cys Leu  Gly Ser Cys
    1190                 1195                 1200


Cys His  Ser Ile Phe Ser Arg  Arg Gln Phe Glu Asn  Tyr Glu Pro
    1205                 1210                 1215


Ile Glu  Lys Val His Val His
    1220                 1225
```

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<210>  62
<211>  82
<212>  PRT
<213>  Porcine transmissible gastroenteritis coronoavirus

<400>  62
```

```
Met Thr Phe Pro Arg Ala Leu Thr Val Ile Asp Asp Asn Gly Met Val
1                5                10                15


Ile Asn Ile Ile Phe Trp Phe Leu Leu Ile Ile Ile Leu Ile Leu Leu
            20                25                30


Ser Ile Ala Leu Leu Asn Ile Ile Lys Leu Cys Met Val Cys Cys Asn
        35                40                45


Leu Gly Arg Thr Val Ile Ile Val Pro Ala Gln His Ala Tyr Asp Ala
    50                55                60


Tyr Lys Asn Phe Met Arg Ile Lys Ala Tyr Asn Pro Asp Gly Ala Leu
65                70                75                80


Leu Ala
```

```
<210>  63
<211>  4376
<212>  PRT
<213>  Severe acute respiratory syndrome virus

<400>  63
```

```
Met Glu Ser Leu Val Leu Gly Val Asn Glu Lys Thr His Val Gln Leu
1                5                10                15


Ser Leu Pro Val Leu Gln Val Arg Asp Val Leu Val Arg Gly Phe Gly
            20                25                30


Asp Ser Val Glu Glu Ala Leu Ser Glu Ala Arg Glu His Leu Lys Asn
        35                40                45
```

```
Gly Thr Cys Gly Leu Val Glu Leu Glu Lys Gly Val Leu Pro Gln Leu
    50                  55                  60

Glu Gln Pro Tyr Val Phe Ile Lys Arg Ser Asp Ala Leu Ser Thr Asn
65                  70                  75                  80

His Gly His Lys Val Val Glu Leu Val Ala Glu Met Asp Gly Ile Gln
                85                  90                  95

Tyr Gly Arg Ser Gly Ile Thr Leu Gly Val Leu Val Pro His Val Gly
            100                 105                 110

Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn
            115                 120                 125

Lys Gly Ala Gly Gly His Ser Tyr Gly Ile Asp Leu Lys Ser Tyr Asp
    130                 135                 140

Leu Gly Asp Glu Leu Gly Thr Asp Pro Ile Glu Asp Tyr Glu Gln Asn
145                 150                 155                 160

Trp Asn Thr Lys His Gly Ser Gly Ala Leu Arg Glu Leu Thr Arg Glu
                165                 170                 175

Leu Asn Gly Gly Ala Val Thr Arg Tyr Val Asp Asn Asn Phe Cys Gly
            180                 185                 190

Pro Asp Gly Tyr Pro Leu Asp Cys Ile Lys Asp Phe Leu Ala Arg Ala
            195                 200                 205

Gly Lys Ser Met Cys Thr Leu Ser Glu Gln Leu Asp Tyr Ile Glu Ser
    210                 215                 220

Lys Arg Gly Val Tyr Cys Cys Arg Asp His Glu His Glu Ile Ala Trp
225                 230                 235                 240

Phe Thr Glu Arg Ser Asp Lys Ser Tyr Glu His Gln Thr Pro Phe Glu
                245                 250                 255

Ile Lys Ser Ala Lys Lys Phe Asp Thr Phe Lys Gly Glu Cys Pro Lys
            260                 265                 270

Phe Val Phe Pro Leu Asn Ser Lys Val Lys Val Ile Gln Pro Arg Val
            275                 280                 285

Glu Lys Lys Lys Thr Glu Gly Phe Met Gly Arg Ile Arg Ser Val Tyr
    290                 295                 300
```

Pro Val Ala Ser Pro Gln Glu Cys Asn Asn Met His Leu Ser Thr Leu
305   310   315   320

Met Lys Cys Asn His Cys Asp Glu Val Ser Trp Gln Thr Cys Asp Phe
            325   330   335

Leu Lys Ala Thr Cys Glu His Cys Gly Thr Glu Asn Leu Val Ile Glu
            340   345   350

Gly Pro Thr Thr Cys Gly Tyr Leu Pro Thr Asn Ala Val Val Lys Met
            355   360   365

Pro Cys Pro Ala Cys Gln Asp Pro Glu Ile Gly Pro Glu His Ser Val
    370   375   380

Ala Asp Tyr His Asn His Ser Asn Ile Glu Thr Arg Leu Arg Lys Gly
385   390   395   400

Gly Arg Thr Arg Cys Phe Gly Gly Cys Val Phe Ala Tyr Val Gly Cys
                405   410   415

Tyr Asn Lys Arg Ala Tyr Trp Val Pro Arg Ala Ser Ala Asp Ile Gly
            420   425   430

Ser Gly His Thr Gly Ile Thr Gly Asp Asn Val Glu Thr Leu Asn Glu
            435   440   445

Asp Leu Leu Glu Ile Leu Ser Arg Glu Arg Val Asn Ile Asn Ile Val
    450   455   460

Gly Asp Phe His Leu Asn Glu Glu Val Ala Ile Ile Leu Ala Ser Phe
465   470   475   480

Ser Ala Ser Thr Ser Ala Phe Ile Asp Thr Ile Lys Ser Leu Asp Tyr
            485   490   495

Lys Ser Phe Lys Thr Ile Val Glu Ser Cys Gly Asn Tyr Lys Val Thr
            500   505   510

Lys Gly Lys Pro Val Lys Gly Ala Trp Asn Ile Gly Gln Gln Arg Ser
            515   520   525

Val Leu Thr Pro Leu Cys Gly Phe Pro Ser Gln Ala Ala Gly Val Ile
    530   535   540

Arg Ser Ile Phe Ala Arg Thr Leu Asp Ala Ala Asn His Ser Ile Pro

545   550   555   560

Asp Leu Gln Arg Ala Ala Val Thr Ile Leu Asp Gly Ile Ser Glu Gln
                565   570   575

Ser Leu Arg Leu Val Asp Ala Met Val Tyr Thr Ser Asp Leu Leu Thr
            580   585   590

Asn Ser Val Ile Ile Met Ala Tyr Val Thr Gly Gly Leu Val Gln Gln
            595   600   605

Thr Ser Gln Trp Leu Ser Asn Leu Leu Gly Thr Thr Val Glu Lys Leu
    610   615   620

Arg Pro Ile Phe Glu Trp Ile Glu Ala Lys Leu Ser Ala Gly Val Glu
625   630   635   640

Phe Leu Lys Asp Ala Trp Glu Ile Leu Lys Phe Leu Ile Thr Gly Val
                645   650   655

Phe Asp Ile Val Lys Gly Gln Ile Gln Val Ala Ser Asp Asn Ile Lys
            660   665   670

Asp Cys Val Lys Cys Phe Ile Asp Val Val Asn Lys Ala Leu Glu Met
        675   680   685

Cys Ile Asp Gln Val Thr Ile Ala Gly Ala Lys Leu Arg Ser Leu Asn
    690   695   700

Leu Gly Glu Val Phe Ile Ala Gln Ser Lys Gly Leu Tyr Arg Gln Cys
705   710   715   720

Ile Arg Gly Lys Glu Gln Leu Gln Leu Leu Met Pro Leu Lys Ala Pro
            725   730   735

Lys Glu Val Thr Phe Leu Glu Gly Asp Ser His Asp Thr Val Leu Thr
            740   745   750

Ser Glu Glu Val Val Leu Lys Asn Gly Glu Leu Glu Ala Leu Glu Thr
        755   760   765

Pro Val Asp Ser Phe Thr Asn Gly Ala Ile Val Gly Thr Pro Val Cys
    770   775   780

Val Asn Gly Leu Met Leu Leu Glu Ile Lys Asp Lys Glu Gln Tyr Cys
785   790   795   800

Ala Leu Ser Pro Gly Leu Leu Ala Thr Asn Asn Val Phe Arg Leu Lys
              805   810   815

Gly Gly Ala Pro Ile Lys Gly Val Thr Phe Gly Glu Asp Thr Val Trp
              820   825   830

Glu Val Gln Gly Tyr Lys Asn Val Arg Ile Thr Phe Glu Leu Asp Glu
              835   840   845

Arg Val Asp Lys Val Leu Asn Glu Lys Cys Ser Val Tyr Thr Val Glu
    850   855   860

Ser Gly Thr Glu Val Thr Glu Phe Ala Cys Val Val Ala Glu Ala Val
865   870   875   880

Val Lys Thr Leu Gln Pro Val Ser Asp Leu Leu Thr Asn Met Gly Ile
              885   890   895

Asp Leu Asp Glu Trp Ser Val Ala Thr Phe Tyr Leu Phe Asp Asp Ala
              900   905   910

Gly Glu Glu Asn Phe Ser Ser Arg Met Tyr Cys Ser Phe Tyr Pro Pro
              915   920   925

Asp Glu Glu Glu Glu Asp Asp Ala Glu Cys Glu Glu Glu Ile Asp
    930   935   940

Glu Thr Cys Glu His Glu Tyr Gly Thr Glu Asp Asp Tyr Gln Gly Leu
945   950   955   960

Pro Leu Glu Phe Gly Ala Ser Ala Glu Thr Val Arg Val Glu Glu Glu
              965   970   975

Glu Glu Glu Asp Trp Leu Asp Asp Thr Thr Glu Gln Ser Glu Ile Glu
              980   985   990

Pro Glu Pro Glu Pro Thr Pro Glu Glu Pro Val Asn Gln Phe Thr Gly
    995   1000   1005

Tyr Leu Lys Leu Thr Asp Asn Val Ala Ile Lys Cys Val Asp Ile
    1010   1015   1020

Val Lys Glu Ala Gln Ser Ala Asn Pro Met Val Ile Val Asn Ala
    1025   1030   1035

Ala Asn Ile His Leu Lys His Gly Gly Gly Val Ala Gly Ala Leu
    1040   1045   1050

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Asn Lys Ala Thr Asn Gly Ala  Met Gln Lys Glu Ser  Asp Asp Tyr
    1055                1060                1065

Ile Lys Leu Asn Gly Pro Leu  Thr Val Gly Gly Ser  Cys Leu Leu
    1070                1075                1080

Ser Gly His Asn Leu Ala Lys  Lys Cys Leu His Val  Val Gly Pro
    1085                1090                1095

Asn Leu Asn Ala Gly Glu Asp  Ile Gln Leu Leu Lys  Ala Ala Tyr
    1100                1105                1110

Glu Asn Phe Asn Ser Gln Asp  Ile Leu Leu Ala Pro  Leu Leu Ser
    1115                1120                1125

Ala Gly Ile Phe Gly Ala Lys  Pro Leu Gln Ser Leu  Gln Val Cys
    1130                1135                1140

Val Gln Thr Val Arg Thr Gln  Val Tyr Ile Ala Val  Asn Asp Lys
    1145                1150                1155

Ala Leu Tyr Glu Gln Val Val  Met Asp Tyr Leu Asp  Asn Leu Lys
    1160                1165                1170

Pro Arg Val Glu Ala Pro Lys  Gln Glu Glu Pro Pro  Asn Thr Glu
    1175                1180                1185

Asp Ser Lys Thr Glu Glu Lys  Ser Val Val Gln Lys  Pro Val Asp
    1190                1195                1200

Val Lys Pro Lys Ile Lys Ala  Cys Ile Asp Glu Val  Thr Thr Thr
    1205                1210                1215

Leu Glu Glu Thr Lys Phe Leu  Thr Asn Lys Leu Leu  Leu Phe Ala
    1220                1225                1230

Asp Ile Asn Gly Lys Leu Tyr  His Asp Ser Gln Asn  Met Leu Arg
    1235                1240                1245

Gly Glu Asp Met Ser Phe Leu  Glu Lys Asp Ala Pro  Tyr Met Val
    1250                1255                1260

Gly Asp Val Ile Thr Ser Gly  Asp Ile Thr Cys Val  Val Ile Pro
    1265                1270                1275

Ser Lys Lys Ala Gly Gly Thr  Thr Glu Met Leu Ser  Arg Ala Leu
    1280                1285                1290
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Lys Lys Val Pro Val Asp Glu Tyr Ile Thr Thr Tyr Pro Gly Gln
    1295   1300   1305

Gly Cys Ala Gly Tyr Thr Leu Glu Glu Ala Lys Thr Ala Leu Lys
    1310   1315   1320

Lys Cys Lys Ser Ala Phe Tyr Val Leu Pro Ser Glu Ala Pro Asn
    1325   1330   1335

Ala Lys Glu Glu Ile Leu Gly Thr Val Ser Trp Asn Leu Arg Glu
    1340   1345   1350

Met Leu Ala His Ala Glu Glu Thr Arg Lys Leu Met Pro Ile Cys
    1355   1360   1365

Met Asp Val Arg Ala Ile Met Ala Thr Ile Gln Arg Lys Tyr Lys
    1370   1375   1380

Gly Ile Lys Ile Gln Glu Gly Ile Val Asp Tyr Gly Val Arg Phe
    1385   1390   1395

Phe Phe Tyr Thr Ser Lys Glu Pro Val Ala Ser Ile Ile Thr Lys
    1400   1405   1410

Leu Asn Ser Leu Asn Glu Pro Leu Val Thr Met Pro Ile Gly Tyr
    1415   1420   1425

Val Thr His Gly Phe Asn Leu Glu Glu Ala Ala Arg Cys Met Arg
    1430   1435   1440

Ser Leu Lys Ala Pro Ala Val Val Ser Val Ser Ser Pro Asp Ala
    1445   1450   1455

Val Thr Thr Tyr Asn Gly Tyr Leu Thr Ser Ser Ser Lys Thr Ser
    1460   1465   1470

Glu Glu His Phe Val Glu Thr Val Ser Leu Ala Gly Ser Tyr Arg
    1475   1480   1485

Asp Trp Ser Tyr Ser Gly Gln Arg Thr Glu Leu Gly Val Glu Phe
    1490   1495   1500

Leu Lys Arg Gly Asp Lys Ile Val Tyr His Thr Leu Glu Ser Pro
    1505   1510   1515

Val Glu Phe His Leu Asp Gly Glu Val Leu Ser Leu Asp Lys Leu
                        Page 145

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                    1520                      1525                      1530


Lys Ser  Leu Leu Ser Leu Arg  Glu Val Lys Thr Ile  Lys Val Phe
    1535                  1540                  1545


Thr Thr  Val Asp Asn Thr Asn  Leu His Thr Gln Leu  Val Asp Met
    1550                  1555                  1560


Ser Met  Thr Tyr Gly Gln Gln  Phe Gly Pro Thr Tyr  Leu Asp Gly
    1565                  1570                  1575


Ala Asp  Val Thr Lys Ile Lys  Pro His Val Asn His  Glu Gly Lys
    1580                  1585                  1590


Thr Phe  Phe Val Leu Pro Ser  Asp Asp Thr Leu Arg  Ser Glu Ala
    1595                  1600                  1605


Phe Glu  Tyr Tyr His Thr Leu  Asp Glu Ser Phe Leu  Gly Arg Tyr
    1610                  1615                  1620


Met Ser  Ala Leu Asn His Thr  Lys Lys Trp Lys Phe  Pro Gln Val
    1625                  1630                  1635


Gly Gly  Leu Thr Ser Ile Lys  Trp Ala Asp Asn Asn  Cys Tyr Leu
    1640                  1645                  1650


Ser Ser  Val Leu Leu Ala Leu  Gln Gln Leu Glu Val  Lys Phe Asn
    1655                  1660                  1665


Ala Pro  Ala Leu Gln Glu Ala  Tyr Tyr Arg Ala Arg  Ala Gly Asp
    1670                  1675                  1680


Ala Ala  Asn Phe Cys Ala Leu  Ile Leu Ala Tyr Ser  Asn Lys Thr
    1685                  1690                  1695


Val Gly  Glu Leu Gly Asp Val  Arg Glu Thr Met Thr  His Leu Leu
    1700                  1705                  1710


Gln His  Ala Asn Leu Glu Ser  Ala Lys Arg Val Leu  Asn Val Val
    1715                  1720                  1725


Cys Lys  His Cys Gly Gln Lys  Thr Thr Thr Leu Thr  Gly Val Glu
    1730                  1735                  1740


Ala Val  Met Tyr Met Gly Thr  Leu Ser Tyr Asp Asn  Leu Lys Thr
    1745                  1750                  1755
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Gly Val Ser Ile Pro Cys Val Cys Gly Arg Asp Ala Thr Gln Tyr
1760   1765   1770

Leu Val Gln Gln Glu Ser Ser Phe Val Met Met Ser Ala Pro Pro
1775   1780   1785

Ala Glu Tyr Lys Leu Gln Gln Gly Thr Phe Leu Cys Ala Asn Glu
1790   1795   1800

Tyr Thr Gly Asn Tyr Gln Cys Gly His Tyr Thr His Ile Thr Ala
1805   1810   1815

Lys Glu Thr Leu Tyr Arg Ile Asp Gly Ala His Leu Thr Lys Met
1820   1825   1830

Ser Glu Tyr Lys Gly Pro Val Thr Asp Val Phe Tyr Lys Glu Thr
1835   1840   1845

Ser Tyr Thr Thr Thr Ile Lys Pro Val Ser Tyr Lys Leu Asp Gly
1850   1855   1860

Val Thr Tyr Thr Glu Ile Glu Pro Lys Leu Asp Gly Tyr Tyr Lys
1865   1870   1875

Lys Asp Asn Ala Tyr Tyr Thr Glu Gln Pro Ile Asp Leu Val Pro
1880   1885   1890

Thr Gln Pro Leu Pro Asn Ala Ser Phe Asp Asn Phe Lys Leu Thr
1895   1900   1905

Cys Ser Asn Thr Lys Phe Ala Asp Asp Leu Asn Gln Met Thr Gly
1910   1915   1920

Phe Thr Lys Pro Ala Ser Arg Glu Leu Ser Val Thr Phe Phe Pro
1925   1930   1935

Asp Leu Asn Gly Asp Val Val Ala Ile Asp Tyr Arg His Tyr Ser
1940   1945   1950

Ala Ser Phe Lys Lys Gly Ala Lys Leu Leu His Lys Pro Ile Val
1955   1960   1965

Trp His Ile Asn Gln Ala Thr Thr Lys Thr Thr Phe Lys Pro Asn
1970   1975   1980

Thr Trp Cys Leu Arg Cys Leu Trp Ser Thr Lys Pro Val Asp Thr
1985   1990   1995

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Ser Asn  Ser Phe Glu Val Leu  Ala Val Glu Asp Thr  Gln Gly Met
    2000                 2005                 2010

Asp Asn  Leu Ala Cys Glu Ser  Gln Gln Pro Thr Ser  Glu Glu Val
    2015                 2020                 2025

Val Glu  Asn Pro Thr Ile Gln  Lys Glu Val Ile Glu  Cys Asp Val
    2030                 2035                 2040

Lys Thr  Thr Glu Val Val Gly  Asn Val Ile Leu Lys  Pro Ser Asp
    2045                 2050                 2055

Glu Gly  Val Lys Val Thr Gln  Glu Leu Gly His Glu  Asp Leu Met
    2060                 2065                 2070

Ala Ala  Tyr Val Glu Asn Thr  Ser Ile Thr Ile Lys  Lys Pro Asn
    2075                 2080                 2085

Glu Leu  Ser Leu Ala Leu Gly  Leu Lys Thr Ile Ala  Thr His Gly
    2090                 2095                 2100

Ile Ala  Ala Ile Asn Ser Val  Pro Trp Ser Lys Ile  Leu Ala Tyr
    2105                 2110                 2115

Val Lys  Pro Phe Leu Gly Gln  Ala Ala Ile Thr Thr  Ser Asn Cys
    2120                 2125                 2130

Ala Lys  Arg Leu Ala Gln Arg  Val Phe Asn Asn Tyr  Met Pro Tyr
    2135                 2140                 2145

Val Phe  Thr Leu Leu Phe Gln  Leu Cys Thr Phe Thr  Lys Ser Thr
    2150                 2155                 2160

Asn Ser  Arg Ile Arg Ala Ser  Leu Pro Thr Thr Ile  Ala Lys Asn
    2165                 2170                 2175

Ser Val  Lys Ser Val Ala Lys  Leu Cys Leu Asp Ala  Gly Ile Asn
    2180                 2185                 2190

Tyr Val  Lys Ser Pro Lys Phe  Ser Lys Leu Phe Thr  Ile Ala Met
    2195                 2200                 2205

Trp Leu  Leu Leu Leu Ser Ile  Cys Leu Gly Ser Leu  Ile Cys Val
    2210                 2215                 2220

Thr Ala  Ala Phe Gly Val Leu  Leu Ser Asn Phe Gly  Ala Pro Ser
    2225                 2230                 2235
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Tyr Cys Asn Gly Val Arg Glu Leu Tyr Leu Asn Ser Ser Asn Val
    2240   2245   2250

Thr Thr Met Asp Phe Cys Glu Gly Ser Phe Pro Cys Ser Ile Cys
    2255   2260   2265

Leu Ser Gly Leu Asp Ser Leu Asp Ser Tyr Pro Ala Leu Glu Thr
    2270   2275   2280

Ile Gln Val Thr Ile Ser Ser Tyr Lys Leu Asp Leu Thr Ile Leu
    2285   2290   2295

Gly Leu Ala Ala Glu Trp Val Leu Ala Tyr Met Leu Phe Thr Lys
    2300   2305   2310

Phe Phe Tyr Leu Leu Gly Leu Ser Ala Ile Met Gln Val Phe Phe
    2315   2320   2325

Gly Tyr Phe Ala Ser His Phe Ile Ser Asn Ser Trp Leu Met Trp
    2330   2335   2340

Phe Ile Ile Ser Ile Val Gln Met Ala Pro Val Ser Ala Met Val
    2345   2350   2355

Arg Met Tyr Ile Phe Phe Ala Ser Phe Tyr Tyr Ile Trp Lys Ser
    2360   2365   2370

Tyr Val His Ile Met Asp Gly Cys Thr Ser Ser Thr Cys Met Met
    2375   2380   2385

Cys Tyr Lys Arg Asn Arg Ala Thr Arg Val Glu Cys Thr Thr Ile
    2390   2395   2400

Val Asn Gly Met Lys Arg Ser Phe Tyr Val Tyr Ala Asn Gly Gly
    2405   2410   2415

Arg Gly Phe Cys Lys Thr His Asn Trp Asn Cys Leu Asn Cys Asp
    2420   2425   2430

Thr Phe Cys Thr Gly Ser Thr Phe Ile Ser Asp Glu Val Ala Arg
    2435   2440   2445

Asp Leu Ser Leu Gln Phe Lys Arg Pro Ile Asn Pro Thr Asp Gln
    2450   2455   2460

Ser Ser Tyr Ile Val Asp Ser Val Ala Val Lys Asn Gly Ala Leu
                                Page 149

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            2465                2470               2475


    His Leu Tyr Phe Asp Lys Ala  Gly Gln Lys Thr Tyr  Glu Arg His
        2480                2485                2490


    Pro Leu Ser His Phe Val Asn  Leu Asp Asn Leu Arg  Ala Asn Asn
        2495                2500                2505


    Thr Lys Gly Ser Leu Pro Ile  Asn Val Ile Val Phe  Asp Gly Lys
        2510                2515                2520


    Ser Lys Cys Asp Glu Ser Ala  Ser Lys Ser Ala Ser  Val Tyr Tyr
        2525                2530                2535


    Ser Gln Leu Met Cys Gln Pro  Ile Leu Leu Leu Asp  Gln Ala Leu
        2540                2545                2550


    Val Ser Asp Val Gly Asp Ser  Thr Glu Val Ser Val  Lys Met Phe
        2555                2560                2565


    Asp Ala Tyr Val Asp Thr Phe  Ser Ala Thr Phe Ser  Val Pro Met
        2570                2575                2580


    Glu Lys Leu Lys Ala Leu Val  Ala Thr Ala His Ser  Glu Leu Ala
        2585                2590                2595


    Lys Gly Val Ala Leu Asp Gly  Val Leu Ser Thr Phe  Val Ser Ala
        2600                2605                2610


    Ala Arg Gln Gly Val Val Asp  Thr Asp Val Asp Thr  Lys Asp Val
        2615                2620                2625


    Ile Glu Cys Leu Lys Leu Ser  His His Ser Asp Leu  Glu Val Thr
        2630                2635                2640


    Gly Asp Ser Cys Asn Asn Phe  Met Leu Thr Tyr Asn  Lys Val Glu
        2645                2650                2655


    Asn Met Thr Pro Arg Asp Leu  Gly Ala Cys Ile Asp  Cys Asn Ala
        2660                2665                2670


    Arg His Ile Asn Ala Gln Val  Ala Lys Ser His Asn  Val Ser Leu
        2675                2680                2685


    Ile Trp Asn Val Lys Asp Tyr  Met Ser Leu Ser Glu  Gln Leu Arg
        2690                2695                2700
```

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Lys Gln  Ile Arg Ser Ala Ala  Lys Lys Asn Asn Ile  Pro Phe Arg
    2705              2710              2715

Leu Thr  Cys Ala Thr Thr Arg  Gln Val Val Asn Val  Ile Thr Thr
    2720              2725              2730

Lys Ile  Ser Leu Lys Gly Gly  Lys Ile Val Ser Thr  Cys Phe Lys
    2735              2740              2745

Leu Met  Leu Lys Ala Thr Leu  Leu Cys Val Leu Ala  Ala Leu Val
    2750              2755              2760

Cys Tyr  Ile Val Met Pro Val  His Thr Leu Ser Ile  His Asp Gly
    2765              2770              2775

Tyr Thr  Asn Glu Ile Ile Gly  Tyr Lys Ala Ile Gln  Asp Gly Val
    2780              2785              2790

Thr Arg  Asp Ile Ile Ser Thr  Asp Asp Cys Phe Ala  Asn Lys His
    2795              2800              2805

Ala Gly  Phe Asp Ala Trp Phe  Ser Gln Arg Gly Gly  Ser Tyr Lys
    2810              2815              2820

Asn Asp  Lys Ser Cys Pro Val  Val Ala Ala Ile Ile  Thr Arg Glu
    2825              2830              2835

Ile Gly  Phe Ile Val Pro Gly  Leu Pro Gly Thr Val  Leu Arg Ala
    2840              2845              2850

Ile Asn  Gly Asp Phe Leu His  Phe Leu Pro Arg Val  Phe Ser Ala
    2855              2860              2865

Val Gly  Asn Ile Cys Tyr Thr  Pro Ser Lys Leu Ile  Glu Tyr Ser
    2870              2875              2880

Asp Phe  Ala Thr Ser Ala Cys  Val Leu Ala Ala Glu  Cys Thr Ile
    2885              2890              2895

Phe Lys  Asp Ala Met Gly Lys  Pro Val Pro Tyr Cys  Tyr Asp Thr
    2900              2905              2910

Asn Leu  Leu Glu Gly Ser Ile  Ser Tyr Ser Glu Leu  Arg Pro Asp
    2915              2920              2925

Thr Arg  Tyr Val Leu Met Asp  Gly Ser Ile Ile Gln  Phe Pro Asn
    2930              2935              2940
```

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```
Thr Tyr  Leu Glu Gly Ser Val  Arg Val Val Thr Thr  Phe Asp Ala
    2945                 2950                2955

Glu Tyr  Cys Arg His Gly Thr  Cys Glu Arg Ser Glu  Val Gly Ile
    2960                 2965                2970

Cys Leu  Ser Thr Ser Gly Arg  Trp Val Leu Asn Asn  Glu His Tyr
    2975                 2980                2985

Arg Ala  Leu Ser Gly Val Phe  Cys Gly Val Asp Ala  Met Asn Leu
    2990                 2995                3000

Ile Ala  Asn Ile Phe Thr Pro  Leu Val Gln Pro Val  Gly Ala Leu
    3005                 3010                3015

Asp Val  Ser Ala Ser Val Val  Ala Gly Gly Ile Ile  Ala Ile Leu
    3020                 3025                3030

Val Thr  Cys Ala Ala Tyr Tyr  Phe Met Lys Phe Arg  Arg Val Phe
    3035                 3040                3045

Gly Glu  Tyr Asn His Val Val  Ala Ala Asn Ala Leu  Leu Phe Leu
    3050                 3055                3060

Met Ser  Phe Thr Ile Leu Cys  Leu Val Pro Ala Tyr  Ser Phe Leu
    3065                 3070                3075

Pro Gly  Val Tyr Ser Val Phe  Tyr Leu Tyr Leu Thr  Phe Tyr Phe
    3080                 3085                3090

Thr Asn  Asp Val Ser Phe Leu  Ala His Leu Gln Trp  Phe Ala Met
    3095                 3100                3105

Phe Ser  Pro Ile Val Pro Phe  Trp Ile Thr Ala Ile  Tyr Val Phe
    3110                 3115                3120

Cys Ile  Ser Leu Lys His Cys  His Trp Phe Phe Asn  Asn Tyr Leu
    3125                 3130                3135

Arg Lys  Arg Val Met Phe Asn  Gly Val Thr Phe Ser  Thr Phe Glu
    3140                 3145                3150

Glu Ala  Ala Leu Cys Thr Phe  Leu Leu Asn Lys Glu  Met Tyr Leu
    3155                 3160                3165

Lys Leu  Arg Ser Glu Thr Leu  Leu Pro Leu Thr Gln  Tyr Asn Arg
    3170                 3175                3180
```

Tyr Leu Ala Leu Tyr Asn Lys Tyr Lys Tyr Phe Ser Gly Ala Leu
    3185   3190   3195

Asp Thr Thr Ser Tyr Arg Glu Ala Ala Cys Cys His Leu Ala Lys
    3200   3205   3210

Ala Leu Asn Asp Phe Ser Asn Ser Gly Ala Asp Val Leu Tyr Gln
    3215   3220   3225

Pro Pro Gln Thr Ser Ile Thr Ser Ala Val Leu Gln Ser Gly Phe
    3230   3235   3240

Arg Lys Met Ala Phe Pro Ser Gly Lys Val Glu Gly Cys Met Val
    3245   3250   3255

Gln Val Thr Cys Gly Thr Thr Thr Leu Asn Gly Leu Trp Leu Asp
    3260   3265   3270

Asp Thr Val Tyr Cys Pro Arg His Val Ile Cys Thr Ala Glu Asp
    3275   3280   3285

Met Leu Asn Pro Asn Tyr Glu Asp Leu Leu Ile Arg Lys Ser Asn
    3290   3295   3300

His Ser Phe Leu Val Gln Ala Gly Asn Val Gln Leu Arg Val Ile
    3305   3310   3315

Gly His Ser Met Gln Asn Cys Leu Leu Arg Leu Lys Val Asp Thr
    3320   3325   3330

Ser Asn Pro Lys Thr Pro Lys Tyr Lys Phe Val Arg Ile Gln Pro
    3335   3340   3345

Gly Gln Thr Phe Ser Val Leu Ala Cys Tyr Asn Gly Ser Pro Ser
    3350   3355   3360

Gly Val Tyr Gln Cys Ala Met Arg Pro Asn His Thr Ile Lys Gly
    3365   3370   3375

Ser Phe Leu Asn Gly Ser Cys Gly Ser Val Gly Phe Asn Ile Asp
    3380   3385   3390

Tyr Asp Cys Val Ser Phe Cys Tyr Met His His Met Glu Leu Pro
    3395   3400   3405

Thr Gly Val His Ala Gly Thr Asp Leu Glu Gly Lys Phe Tyr Gly

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            3410                 3415              3420


Pro Phe Val Asp Arg Gln Thr  Ala Gln Ala Ala Gly  Thr Asp Thr
    3425             3430              3435


Thr Ile Thr Leu Asn Val Leu  Ala Trp Leu Tyr Ala  Ala Val Ile
    3440             3445              3450


Asn Gly Asp Arg Trp Phe Leu  Asn Arg Phe Thr Thr  Thr Leu Asn
    3455             3460              3465


Asp Phe Asn Leu Val Ala Met  Lys Tyr Asn Tyr Glu  Pro Leu Thr
    3470             3475              3480


Gln Asp His Val Asp Ile Leu  Gly Pro Leu Ser Ala  Gln Thr Gly
    3485             3490              3495


Ile Ala Val Leu Asp Met Cys  Ala Ala Leu Lys Glu  Leu Leu Gln
    3500             3505              3510


Asn Gly Met Asn Gly Arg Thr  Ile Leu Gly Ser Thr  Ile Leu Glu
    3515             3520              3525


Asp Glu Phe Thr Pro Phe Asp  Val Val Arg Gln Cys  Ser Gly Val
    3530             3535              3540


Thr Phe Gln Gly Lys Phe Lys  Lys Ile Val Lys Gly  Thr His His
    3545             3550              3555


Trp Met Leu Leu Thr Phe Leu  Thr Ser Leu Leu Ile  Leu Val Gln
    3560             3565              3570


Ser Thr Gln Trp Ser Leu Phe  Phe Phe Val Tyr Glu  Asn Ala Phe
    3575             3580              3585


Leu Pro Phe Thr Leu Gly Ile  Met Ala Ile Ala Ala  Cys Ala Met
    3590             3595              3600


Leu Leu Val Lys His Lys His  Ala Phe Leu Cys Leu  Phe Leu Leu
    3605             3610              3615


Pro Ser Leu Ala Thr Val Ala  Tyr Phe Asn Met Val  Tyr Met Pro
    3620             3625              3630


Ala Ser Trp Val Met Arg Ile  Met Thr Trp Leu Glu  Leu Ala Asp
    3635             3640              3645
```

Thr Ser Leu Ser Gly Tyr Arg Leu Lys Asp Cys Val Met Tyr Ala
    3650   3655   3660

Ser Ala Leu Val Leu Leu Ile Leu Met Thr Ala Arg Thr Val Tyr
    3665   3670   3675

Asp Asp Ala Ala Arg Arg Val Trp Thr Leu Met Asn Val Ile Thr
    3680   3685   3690

Leu Val Tyr Lys Val Tyr Tyr Gly Asn Ala Leu Asp Gln Ala Ile
    3695   3700   3705

Ser Met Trp Ala Leu Val Ile Ser Val Thr Ser Asn Tyr Ser Gly
    3710   3715   3720

Val Val Thr Thr Ile Met Phe Leu Ala Arg Ala Ile Val Phe Val
    3725   3730   3735

Cys Val Glu Tyr Tyr Pro Leu Leu Phe Ile Thr Gly Asn Thr Leu
    3740   3745   3750

Gln Cys Ile Met Leu Val Tyr Cys Phe Leu Gly Tyr Cys Cys Cys
    3755   3760   3765

Cys Tyr Phe Gly Leu Phe Cys Leu Leu Asn Arg Tyr Phe Arg Leu
    3770   3775   3780

Thr Leu Gly Val Tyr Asp Tyr Leu Val Ser Thr Gln Glu Phe Arg
    3785   3790   3795

Tyr Met Asn Ser Gln Gly Leu Leu Pro Pro Lys Ser Ser Ile Asp
    3800   3805   3810

Ala Phe Lys Leu Asn Ile Lys Leu Leu Gly Ile Gly Gly Lys Pro
    3815   3820   3825

Cys Ile Lys Val Ala Thr Val Gln Ser Lys Met Ser Asp Val Lys
    3830   3835   3840

Cys Thr Ser Val Val Leu Leu Ser Val Leu Gln Gln Leu Arg Val
    3845   3850   3855

Glu Ser Ser Ser Lys Leu Trp Ala Gln Cys Val Gln Leu His Asn
    3860   3865   3870

Asp Ile Leu Leu Ala Lys Asp Thr Thr Glu Ala Phe Glu Lys Met
    3875   3880   3885

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```
Val Ser  Leu Leu Ser Val Leu  Leu Ser Met Gln Gly  Ala Val Asp
    3890             3895             3900

Ile Asn  Arg Leu Cys Glu Glu  Met Leu Asp Asn Arg  Ala Thr Leu
    3905             3910             3915

Gln Ala  Ile Ala Ser Glu Phe  Ser Ser Leu Pro Ser  Tyr Ala Ala
    3920             3925             3930

Tyr Ala  Thr Ala Gln Glu Ala  Tyr Glu Gln Ala Val  Ala Asn Gly
    3935             3940             3945

Asp Ser  Glu Val Val Leu Lys  Lys Leu Lys Lys Ser  Leu Asn Val
    3950             3955             3960

Ala Lys  Ser Glu Phe Asp Arg  Asp Ala Ala Met Gln  Arg Lys Leu
    3965             3970             3975

Glu Lys  Met Ala Asp Gln Ala  Met Thr Gln Met Tyr  Lys Gln Ala
    3980             3985             3990

Arg Ser  Glu Asp Lys Arg Ala  Lys Val Thr Ser Ala  Met Gln Thr
    3995             4000             4005

Met Leu  Phe Thr Met Leu Arg  Lys Leu Asp Asn Asp  Ala Leu Asn
    4010             4015             4020

Asn Ile  Ile Asn Asn Ala Arg  Asp Gly Cys Val Pro  Leu Asn Ile
    4025             4030             4035

Ile Pro  Leu Thr Thr Ala Ala  Lys Leu Met Val Val  Val Pro Asp
    4040             4045             4050

Tyr Gly  Thr Tyr Lys Asn Thr  Cys Asp Gly Asn Thr  Phe Thr Tyr
    4055             4060             4065

Ala Ser  Ala Leu Trp Glu Ile  Gln Gln Val Val Asp  Ala Asp Ser
    4070             4075             4080

Lys Ile  Val Gln Leu Ser Glu  Ile Asn Met Asp Asn  Ser Pro Asn
    4085             4090             4095

Leu Ala  Trp Pro Leu Ile Val  Thr Ala Leu Arg Ala  Asn Ser Ala
    4100             4105             4110

Val Lys  Leu Gln Asn Asn Glu  Leu Ser Pro Val Ala  Leu Arg Gln
    4115             4120             4125
```

Met Ser Cys Ala Ala Gly Thr Thr Gln Thr Ala Cys Thr Asp Asp
    4130   4135   4140

Asn Ala Leu Ala Tyr Tyr Asn Asn Ser Lys Gly Gly Arg Phe Val
    4145   4150   4155

Leu Ala Leu Leu Ser Asp His Gln Asp Leu Lys Trp Ala Arg Phe
    4160   4165   4170

Pro Lys Ser Asp Gly Thr Gly Thr Ile Tyr Thr Glu Leu Glu Pro
    4175   4180   4185

Pro Cys Arg Phe Val Thr Asp Thr Pro Lys Gly Pro Lys Val Lys
    4190   4195   4200

Tyr Leu Tyr Phe Ile Lys Gly Leu Asn Asn Leu Asn Arg Gly Met
    4205   4210   4215

Val Leu Gly Ser Leu Ala Ala Thr Val Arg Leu Gln Ala Gly Asn
    4220   4225   4230

Ala Thr Glu Val Pro Ala Asn Ser Thr Val Leu Ser Phe Cys Ala
    4235   4240   4245

Phe Ala Val Asp Pro Ala Lys Ala Tyr Lys Asp Tyr Leu Ala Ser
    4250   4255   4260

Gly Gly Gln Pro Ile Thr Asn Cys Val Lys Met Leu Cys Thr His
    4265   4270   4275

Thr Gly Thr Gly Gln Ala Ile Thr Val Thr Pro Glu Ala Asn Met
    4280   4285   4290

Asp Gln Glu Ser Phe Gly Gly Ala Ser Cys Cys Leu Tyr Cys Arg
    4295   4300   4305

Cys His Ile Asp His Pro Asn Pro Lys Gly Phe Cys Asp Leu Lys
    4310   4315   4320

Gly Lys Tyr Val Gln Ile Pro Thr Thr Cys Ala Asn Asp Pro Val
    4325   4330   4335

Gly Phe Thr Leu Arg Asn Thr Val Cys Thr Val Cys Gly Met Trp
    4340   4345   4350

Lys Gly Tyr Gly Cys Ser Cys Asp Gln Leu Arg Glu Pro Leu Met

```
                                                    4360                    4365
     4355
```

```
Gln Ser  Ala Asp Ala Ser Thr  Phe
    4370                 4375
```

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<210>  64
<211>  2697
<212>  PRT
<213>  Severe acute respiratory syndrome virus
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```
<400>  64
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Phe Lys Arg Val Cys Gly Val Ser Ala Ala Arg Leu Thr Pro Cys Gly
1               5                   10                  15
```

```
Thr Gly Thr Ser Thr Asp Val Val Tyr Arg Ala Phe Asp Ile Tyr Asn
            20                  25                  30
```

```
Glu Lys Val Ala Gly Phe Ala Lys Phe Leu Lys Thr Asn Cys Cys Arg
        35                  40                  45
```

```
Phe Gln Glu Lys Asp Glu Glu Gly Asn Leu Leu Asp Ser Tyr Phe Val
    50                  55                  60
```

```
Val Lys Arg His Thr Met Ser Asn Tyr Gln His Glu Glu Thr Ile Tyr
65              70                  75                  80
```

```
Asn Leu Val Lys Asp Cys Pro Ala Val Ala Val His Asp Phe Phe Lys
            85                  90                  95
```

```
Phe Arg Val Asp Gly Asp Met Val Pro His Ile Ser Arg Gln Arg Leu
            100                 105                 110
```

```
Thr Lys Tyr Thr Met Ala Asp Leu Val Tyr Ala Leu Arg His Phe Asp
        115                 120                 125
```

```
Glu Gly Asn Cys Asp Thr Leu Lys Glu Ile Leu Val Thr Tyr Asn Cys
    130                 135                 140
```

```
Cys Asp Asp Asp Tyr Phe Asn Lys Lys Asp Trp Tyr Asp Phe Val Glu
145                 150                 155                 160
```

```
Asn Pro Asp Ile Leu Arg Val Tyr Ala Asn Leu Gly Glu Arg Val Arg
                165                 170                 175
```

```
Gln Ser Leu Leu Lys Thr Val Gln Phe Cys Asp Ala Met Arg Asp Ala
            180                 185                 190
```

```
Gly Ile Val Gly Val Leu Thr Leu Asp Asn Gln Asp Leu Asn Gly Asn
```

```
              195                  200                 205

Trp Tyr Asp Phe Gly Asp Phe Val Gln Val Ala Pro Gly Cys Gly Val
    210             215             220

Pro Ile Val Asp Ser Tyr Tyr Ser Leu Leu Met Pro Ile Leu Thr Leu
225             230             235             240

Thr Arg Ala Leu Ala Ala Glu Ser His Met Asp Ala Asp Leu Ala Lys
            245             250             255

Pro Leu Ile Lys Trp Asp Leu Leu Lys Tyr Asp Phe Thr Glu Glu Arg
            260             265             270

Leu Cys Leu Phe Asp Arg Tyr Phe Lys Tyr Trp Asp Gln Thr Tyr His
        275             280             285

Pro Asn Cys Ile Asn Cys Leu Asp Asp Arg Cys Ile Leu His Cys Ala
    290             295             300

Asn Phe Asn Val Leu Phe Ser Thr Val Phe Pro Pro Thr Ser Phe Gly
305             310             315             320

Pro Leu Val Arg Lys Ile Phe Val Asp Gly Val Pro Phe Val Val Ser
            325             330             335

Thr Gly Tyr His Phe Arg Glu Leu Gly Val Val His Asn Gln Asp Val
            340             345             350

Asn Leu His Ser Ser Arg Leu Ser Phe Lys Glu Leu Leu Val Tyr Ala
        355             360             365

Ala Asp Pro Ala Met His Ala Ala Ser Gly Asn Leu Leu Leu Asp Lys
    370             375             380

Arg Thr Thr Cys Phe Ser Val Ala Ala Leu Thr Asn Asn Val Ala Phe
385             390             395             400

Gln Thr Val Lys Pro Gly Asn Phe Asn Lys Asp Phe Tyr Asp Phe Ala
            405             410             415

Val Ser Lys Gly Phe Phe Lys Glu Gly Ser Ser Val Glu Leu Lys His
            420             425             430

Phe Phe Phe Ala Gln Asp Gly Asn Ala Ala Ile Ser Asp Tyr Asp Tyr
        435             440             445
```

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Tyr Arg Tyr Asn Leu Pro Thr Met Cys Asp Ile Arg Gln Leu Leu Phe
450   455   460

Val Val Glu Val Val Asp Lys Tyr Phe Asp Cys Tyr Asp Gly Gly Cys
465   470   475   480

Ile Asn Ala Asn Gln Val Ile Val Asn Asn Leu Asp Lys Ser Ala Gly
                485   490   495

Phe Pro Phe Asn Lys Trp Gly Lys Ala Arg Leu Tyr Tyr Asp Ser Met
            500   505   510

Ser Tyr Glu Asp Gln Asp Ala Leu Phe Ala Tyr Thr Lys Arg Asn Val
        515   520   525

Ile Pro Thr Ile Thr Gln Met Asn Leu Lys Tyr Ala Ile Ser Ala Lys
    530   535   540

Asn Arg Ala Arg Thr Val Ala Gly Val Ser Ile Cys Ser Thr Met Thr
545   550   555   560

Asn Arg Gln Phe His Gln Lys Leu Leu Lys Ser Ile Ala Ala Thr Arg
                565   570   575

Gly Ala Thr Val Val Ile Gly Thr Ser Lys Phe Tyr Gly Gly Trp His
            580   585   590

Asn Met Leu Lys Thr Val Tyr Ser Asp Val Glu Thr Pro His Leu Met
        595   600   605

Gly Trp Asp Tyr Pro Lys Cys Asp Arg Ala Met Pro Asn Met Leu Arg
    610   615   620

Ile Met Ala Ser Leu Val Leu Ala Arg Lys His Asn Thr Cys Cys Asn
625   630   635   640

Leu Ser His Arg Phe Tyr Arg Leu Ala Asn Glu Cys Ala Gln Val Leu
                645   650   655

Ser Glu Met Val Met Cys Gly Gly Ser Leu Tyr Val Lys Pro Gly Gly
            660   665   670

Thr Ser Ser Gly Asp Ala Thr Thr Ala Tyr Ala Asn Ser Val Phe Asn
        675   680   685

Ile Cys Gln Ala Val Thr Ala Asn Val Asn Ala Leu Leu Ser Thr Asp
    690   695   700

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```
Gly Asn Lys Ile Ala Asp Lys Tyr Val Arg Asn Leu Gln His Arg Leu
705             710             715             720

Tyr Glu Cys Leu Tyr Arg Asn Arg Asp Val Asp His Glu Phe Val Asp
                725             730             735

Glu Phe Tyr Ala Tyr Leu Arg Lys His Phe Ser Met Met Ile Leu Ser
            740             745             750

Asp Asp Ala Val Val Cys Tyr Asn Ser Asn Tyr Ala Ala Gln Gly Leu
        755             760             765

Val Ala Ser Ile Lys Asn Phe Lys Ala Val Leu Tyr Tyr Gln Asn Asn
    770             775             780

Val Phe Met Ser Glu Ala Lys Cys Trp Thr Glu Thr Asp Leu Thr Lys
785             790             795             800

Gly Pro His Glu Phe Cys Ser Gln His Thr Met Leu Val Lys Gln Gly
            805             810             815

Asp Asp Tyr Val Tyr Leu Pro Tyr Pro Asp Pro Ser Arg Ile Leu Gly
        820             825             830

Ala Gly Cys Phe Val Asp Asp Ile Val Lys Thr Asp Gly Thr Leu Met
        835             840             845

Ile Glu Arg Phe Val Ser Leu Ala Ile Asp Ala Tyr Pro Leu Thr Lys
    850             855             860

His Pro Asn Gln Glu Tyr Ala Asp Val Phe His Leu Tyr Leu Gln Tyr
865             870             875             880

Ile Arg Lys Leu His Asp Glu Leu Thr Gly His Met Leu Asp Met Tyr
            885             890             895

Ser Val Met Leu Thr Asn Asp Asn Thr Ser Arg Tyr Trp Glu Pro Glu
            900             905             910

Phe Tyr Glu Ala Met Tyr Thr Pro His Thr Val Leu Gln Ala Val Gly
        915             920             925

Ala Cys Val Leu Cys Asn Ser Gln Thr Ser Leu Arg Cys Gly Ala Cys
    930             935             940

Ile Arg Arg Pro Phe Leu Cys Cys Lys Cys Cys Tyr Asp His Val Ile
945             950             955             960
```

Ser Thr Ser His Lys Leu Val Leu Ser Val Asn Pro Tyr Val Cys Asn
        965   970   975

Ala Pro Gly Cys Asp Val Thr Asp Val Thr Gln Leu Tyr Leu Gly Gly
        980   985   990

Met Ser Tyr Tyr Cys Lys Ser His Lys Pro Pro Ile Ser Phe Pro Leu
     995   1000   1005

Cys Ala Asn Gly Gln Val Phe Gly Leu Tyr Lys Asn Thr Cys Val
 1010   1015   1020

Gly Ser Asp Asn Val Thr Asp Phe Asn Ala Ile Ala Thr Cys Asp
 1025   1030   1035

Trp Thr Asn Ala Gly Asp Tyr Ile Leu Ala Asn Thr Cys Thr Glu
 1040   1045   1050

Arg Leu Lys Leu Phe Ala Ala Glu Thr Leu Lys Ala Thr Glu Glu
 1055   1060   1065

Thr Phe Lys Leu Ser Tyr Gly Ile Ala Thr Val Arg Glu Val Leu
 1070   1075   1080

Ser Asp Arg Glu Leu His Leu Ser Trp Glu Val Gly Lys Pro Arg
 1085   1090   1095

Pro Pro Leu Asn Arg Asn Tyr Val Phe Thr Gly Tyr Arg Val Thr
 1100   1105   1110

Lys Asn Ser Lys Val Gln Ile Gly Glu Tyr Thr Phe Glu Lys Gly
 1115   1120   1125

Asp Tyr Gly Asp Ala Val Val Tyr Arg Gly Thr Thr Thr Tyr Lys
 1130   1135   1140

Leu Asn Val Gly Asp Tyr Phe Val Leu Thr Ser His Thr Val Met
 1145   1150   1155

Pro Leu Ser Ala Pro Thr Leu Val Pro Gln Glu His Tyr Val Arg
 1160   1165   1170

Ile Thr Gly Leu Tyr Pro Thr Leu Asn Ile Ser Asp Glu Phe Ser
 1175   1180   1185

Ser Asn Val Ala Asn Tyr Gln Lys Val Gly Met Gln Lys Tyr Ser

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          1190                    1195                    1200

Thr Leu Gln Gly Pro Pro Gly  Thr Gly Lys Ser His  Phe Ala Ile
          1205                    1210                    1215

Gly Leu Ala Leu Tyr Tyr Pro  Ser Ala Arg Ile Val  Tyr Thr Ala
          1220                    1225                    1230

Cys Ser His Ala Ala Val Asp  Ala Leu Cys Glu Lys  Ala Leu Lys
          1235                    1240                    1245

Tyr Leu Pro Ile Asp Lys Cys  Ser Arg Ile Ile Pro  Ala Arg Ala
          1250                    1255                    1260

Arg Val Glu Cys Phe Asp Lys  Phe Lys Val Asn Ser  Thr Leu Glu
          1265                    1270                    1275

Gln Tyr Val Phe Cys Thr Val  Asn Ala Leu Pro Glu  Thr Thr Ala
          1280                    1285                    1290

Asp Ile Val Val Phe Asp Glu  Ile Ser Met Ala Thr  Asn Tyr Asp
          1295                    1300                    1305

Leu Ser Val Val Asn Ala Arg  Leu Arg Ala Lys His  Tyr Val Tyr
          1310                    1315                    1320

Ile Gly Asp Pro Ala Gln Leu  Pro Ala Pro Arg Thr  Leu Leu Thr
          1325                    1330                    1335

Lys Gly Thr Leu Glu Pro Glu  Tyr Phe Asn Ser Val  Cys Arg Leu
          1340                    1345                    1350

Met Lys Thr Ile Gly Pro Asp  Met Phe Leu Gly Thr  Cys Arg Arg
          1355                    1360                    1365

Cys Pro Ala Glu Ile Val Asp  Thr Val Ser Ala Leu  Val Tyr Asp
          1370                    1375                    1380

Asn Lys Leu Lys Ala His Lys  Asp Lys Ser Ala Gln  Cys Phe Lys
          1385                    1390                    1395

Met Phe Tyr Lys Gly Val Ile  Thr His Asp Val Ser  Ser Ala Ile
          1400                    1405                    1410

Asn Arg Pro Gln Ile Gly Val  Val Arg Glu Phe Leu  Thr Arg Asn
          1415                    1420                    1425
```

Pro Ala Trp Arg Lys Ala Val Phe Ile Ser Pro Tyr Asn Ser Gln
    1430   1435   1440

Asn Ala Val Ala Ser Lys Ile Leu Gly Leu Pro Thr Gln Thr Val
    1445   1450   1455

Asp Ser Ser Gln Gly Ser Glu Tyr Asp Tyr Val Ile Phe Thr Gln
    1460   1465   1470

Thr Thr Glu Thr Ala His Ser Cys Asn Val Asn Arg Phe Asn Val
    1475   1480   1485

Ala Ile Thr Arg Ala Lys Ile Gly Ile Leu Cys Ile Met Ser Asp
    1490   1495   1500

Arg Asp Leu Tyr Asp Lys Leu Gln Phe Thr Ser Leu Glu Ile Pro
    1505   1510   1515

Arg Arg Asn Val Ala Thr Leu Gln Ala Glu Asn Val Thr Gly Leu
    1520   1525   1530

Phe Lys Asp Cys Ser Lys Ile Ile Thr Gly Leu His Pro Thr Gln
    1535   1540   1545

Ala Pro Thr His Leu Ser Val Asp Ile Lys Phe Lys Thr Glu Gly
    1550   1555   1560

Leu Cys Val Asp Ile Pro Gly Ile Pro Lys Asp Met Thr Tyr Arg
    1565   1570   1575

Arg Leu Ile Ser Met Met Gly Phe Lys Met Asn Tyr Gln Val Asn
    1580   1585   1590

Gly Tyr Pro Asn Met Phe Ile Thr Arg Glu Glu Ala Ile Arg His
    1595   1600   1605

Val Arg Ala Trp Ile Gly Phe Asp Val Glu Gly Cys His Ala Thr
    1610   1615   1620

Arg Asp Ala Val Gly Thr Asn Leu Pro Leu Gln Leu Gly Phe Ser
    1625   1630   1635

Thr Gly Val Asn Leu Val Ala Val Pro Thr Gly Tyr Val Asp Thr
    1640   1645   1650

Glu Asn Asn Thr Glu Phe Thr Arg Val Asn Ala Lys Pro Pro Pro
    1655   1660   1665

```
Gly Asp Gln Phe Lys His Leu Ile Pro Leu Met Tyr Lys Gly Leu
    1670              1675          1680
```

```
Pro Trp Asn Val Val Arg Ile Lys Ile Val Gln Met Leu Ser Asp
    1685              1690          1695
```

```
Thr Leu Lys Gly Leu Ser Asp Arg Val Val Phe Val Leu Trp Ala
    1700              1705          1710
```

```
His Gly Phe Glu Leu Thr Ser Met Lys Tyr Phe Val Lys Ile Gly
    1715              1720          1725
```

```
Pro Glu Arg Thr Cys Cys Leu Cys Asp Lys Arg Ala Thr Cys Phe
    1730              1735          1740
```

```
Ser Thr Ser Ser Asp Thr Tyr Ala Cys Trp Asn His Ser Val Gly
    1745              1750          1755
```

```
Phe Asp Tyr Val Tyr Asn Pro Phe Met Ile Asp Val Gln Gln Trp
    1760              1765          1770
```

```
Gly Phe Thr Gly Asn Leu Gln Ser Asn His Asp Gln His Cys Gln
    1775              1780          1785
```

```
Val His Gly Asn Ala His Val Ala Ser Cys Asp Ala Ile Met Thr
    1790              1795          1800
```

```
Arg Cys Leu Ala Val His Glu Cys Phe Val Lys Arg Val Asp Trp
    1805              1810          1815
```

```
Ser Val Glu Tyr Pro Ile Ile Gly Asp Glu Leu Arg Val Asn Ser
    1820              1825          1830
```

```
Ala Cys Arg Lys Val Gln His Met Val Val Lys Ser Ala Leu Leu
    1835              1840          1845
```

```
Ala Asp Lys Phe Pro Val Leu His Asp Ile Gly Asn Pro Lys Ala
    1850              1855          1860
```

```
Ile Lys Cys Val Pro Gln Ala Glu Val Glu Trp Lys Phe Tyr Asp
    1865              1870          1875
```

```
Ala Gln Pro Cys Ser Asp Lys Ala Tyr Lys Ile Glu Glu Leu Phe
    1880              1885          1890
```

```
Tyr Ser Tyr Ala Thr His His Asp Lys Phe Thr Asp Gly Val Cys
    1895              1900          1905
```

Leu Phe Trp Asn Cys Asn Val Asp Arg Tyr Pro Ala Asn Ala Ile
    1910   1915   1920

Val Cys Arg Phe Asp Thr Arg Val Leu Ser Asn Leu Asn Leu Pro
    1925   1930   1935

Gly Cys Asp Gly Gly Ser Leu Tyr Val Asn Lys His Ala Phe His
    1940   1945   1950

Thr Pro Ala Phe Asp Lys Ser Ala Phe Thr Asn Leu Lys Gln Leu
    1955   1960   1965

Pro Phe Phe Tyr Tyr Ser Asp Ser Pro Cys Glu Ser His Gly Lys
    1970   1975   1980   .

Gln Val Val Ser Asp Ile Asp Tyr Val Pro Leu Lys Ser Ala Thr
    1985   1990   1995

Cys Ile Thr Arg Cys Asn Leu Gly Gly Ala Val Cys Arg His His
    2000   2005   2010

Ala Asn Glu Tyr Arg Gln Tyr Leu Asp Ala Tyr Asn Met Met Ile
    2015   2020   2025

Ser Ala Gly Phe Ser Leu Trp Ile Tyr Lys Gln Phe Asp Thr Tyr
    2030   2035   2040

Asn Leu Trp Asn Thr Phe Thr Arg Leu Gln Ser Leu Glu Asn Val
    2045   2050   2055

Ala Tyr Asn Val Val Asn Lys Gly His Phe Asp Gly His Ala Gly
    2060   2065   2070

Glu Ala Pro Val Ser Ile Ile Asn Asn Ala Val Tyr Thr Lys Val
    2075   2080   2085

Asp Gly Ile Asp Val Glu Ile Phe Glu Asn Lys Thr Thr Leu Pro
    2090   2095   2100

Val Asn Val Ala Phe Glu Leu Trp Ala Lys Arg Asn Ile Lys Pro
    2105   2110   2115

Val Pro Glu Ile Lys Ile Leu Asn Asn Leu Gly Val Asp Ile Ala
    2120   2125   2130

Ala Asn Thr Val Ile Trp Asp Tyr Lys Arg Glu Ala Pro Ala His
                                Page 166

2135   2140   2145

Val Ser Thr Ile Gly Val Cys Thr Met Thr Asp Ile Ala Lys Lys
    2150   2155   2160

Pro Thr Glu Ser Ala Cys Ser Ser Leu Thr Val Leu Phe Asp Gly
    2165   2170   2175

Arg Val Glu Gly Gln Val Asp Leu Phe Arg Asn Ala Arg Asn Gly
    2180   2185   2190

Val Leu Ile Thr Glu Gly Ser Val Lys Gly Leu Thr Pro Ser Lys
    2195   2200   2205

Gly Pro Ala Gln Ala Ser Val Asn Gly Val Thr Leu Ile Gly Glu
    2210   2215   2220

Ser Val Lys Thr Gln Phe Asn Tyr Phe Lys Lys Val Asp Gly Ile
    2225   2230   2235

Ile Gln Gln Leu Pro Glu Thr Tyr Phe Thr Gln Ser Arg Asp Leu
    2240   2245   2250

Glu Asp Phe Lys Pro Arg Ser Gln Met Glu Thr Asp Phe Leu Glu
    2255   2260   2265

Leu Ala Met Asp Glu Phe Ile Gln Arg Tyr Lys Leu Glu Gly Tyr
    2270   2275   2280

Ala Phe Glu His Ile Val Tyr Gly Asp Phe Ser His Gly Gln Leu
    2285   2290   2295

Gly Gly Leu His Leu Met Ile Gly Leu Ala Lys Arg Ser Gln Asp
    2300   2305   2310

Ser Pro Leu Lys Leu Glu Asp Phe Ile Pro Met Asp Ser Thr Val
    2315   2320   2325

Lys Asn Tyr Phe Ile Thr Asp Ala Gln Thr Gly Ser Ser Lys Cys
    2330   2335   2340

Val Cys Ser Val Ile Asp Leu Leu Leu Asp Asp Phe Val Glu Ile
    2345   2350   2355

Ile Lys Ser Gln Asp Leu Ser Val Ile Ser Lys Val Val Lys Val
    2360   2365   2370

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```
Thr Ile  Asp Tyr Ala Glu Ile  Ser Phe Met Leu Trp  Cys Lys Asp
    2375                  2380              2385

Gly His  Val Glu Thr Phe Tyr  Pro Lys Leu Gln Ala  Ser Gln Ala
    2390                  2395              2400

Trp Gln  Pro Gly Val Ala Met  Pro Asn Leu Tyr Lys  Met Gln Arg
    2405                  2410              2415

Met Leu  Leu Glu Lys Cys Asp  Leu Gln Asn Tyr Gly  Glu Asn Ala
    2420                  2425              2430

Val Ile  Pro Lys Gly Ile Met  Met Asn Val Ala Lys  Tyr Thr Gln
    2435                  2440              2445

Leu Cys  Gln Tyr Leu Asn Thr  Leu Thr Leu Ala Val  Pro Tyr Asn
    2450                  2455              2460

Met Arg  Val Ile His Phe Gly  Ala Gly Ser Asp Lys  Gly Val Ala
    2465                  2470              2475

Pro Gly  Thr Ala Val Leu Arg  Gln Trp Leu Pro Thr  Gly Thr Leu
    2480                  2485              2490

Leu Val  Asp Ser Asp Leu Asn  Asp Phe Val Ser Asp  Ala Asp Ser
    2495                  2500              2505

Thr Leu  Ile Gly Asp Cys Ala  Thr Val His Thr Ala  Asn Lys Trp
    2510                  2515              2520

Asp Leu  Ile Ile Ser Asp Met  Tyr Asp Pro Arg Thr  Lys His Val
    2525                  2530              2535

Thr Lys  Glu Asn Asp Ser Lys  Glu Gly Phe Phe Thr  Tyr Leu Cys
    2540                  2545              2550

Gly Phe  Ile Lys Gln Lys Leu  Ala Leu Gly Gly Ser  Ile Ala Val
    2555                  2560              2565

Lys Ile  Thr Glu His Ser Trp  Asn Ala Asp Leu Tyr  Lys Leu Met
    2570                  2575              2580

Gly His  Phe Ser Trp Trp Thr  Ala Phe Val Thr Asn  Val Asn Ala
    2585                  2590              2595

Ser Ser  Ser Glu Ala Phe Leu  Ile Gly Ala Asn Tyr  Leu Gly Lys
    2600                  2605              2610
```

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```
Pro Lys Glu Gln Ile Asp Gly  Tyr Thr Met His Ala  Asn Tyr Ile
    2615            2620            2625

Phe Trp Arg Asn Thr Asn Pro  Ile Gln Leu Ser Ser  Tyr Ser Leu
    2630            2635            2640

Phe Asp Met Ser Lys Phe Pro  Leu Lys Leu Arg Gly  Thr Ala Val
    2645            2650            2655

Met Ser Leu Lys Glu Asn Gln  Ile Asn Asp Met Ile  Tyr Ser Leu
    2660            2665            2670

Leu Glu Lys Gly Arg Leu Ile  Ile Arg Glu Asn Asn  Arg Val Val
    2675            2680            2685

Val Ser Ser Asp Ile Leu Val  Asn Asn
    2690            2695
```

<210> 65
<211> 274
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 65

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Met Asp Leu Phe Met Arg Phe Phe Thr Leu Arg Ser Ile Thr Ala Gln
1               5                   10                  15

Pro Val Lys Ile Asp Asn Ala Ser Pro Ala Ser Thr Val His Ala Thr
            20                  25                  30

Ala Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly Trp Leu Val Ile
        35                  40                  45

Gly Val Ala Phe Leu Ala Val Phe Gln Ser Ala Thr Lys Ile Ile Ala
    50                  55                  60

Leu Asn Lys Arg Trp Gln Leu Ala Leu Tyr Lys Gly Phe Gln Phe Ile
65                  70                  75                  80

Cys Asn Leu Leu Leu Leu Phe Val Thr Ile Tyr Ser His Leu Leu Leu
                85                  90                  95

Val Ala Ala Gly Met Glu Ala Gln Phe Leu Tyr Leu Tyr Ala Leu Ile
                100                 105                 110

Tyr Phe Leu Gln Cys Ile Asn Ala Cys Arg Ile Ile Met Arg Cys Trp
        115                 120                 125
```

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```
Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu Tyr Asp Ala Asn
    130             135             140

Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr Cys Ile Pro Tyr
145             150             155             160

Asn Ser Val Thr Asp Thr Ile Val Val Thr Glu Gly Asp Gly Ile Ser
                165             170             175

Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly Tyr Ser Glu Asp
            180             185             190

Arg His Ser Gly Val Lys Asp Tyr Val Val Val His Gly Tyr Phe Thr
        195             200             205

Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr Thr Asp Thr Gly
    210             215             220

Ile Glu Asn Ala Thr Phe Phe Ile Phe Asn Lys Leu Val Lys Asp Pro
225             230             235             240

Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser Gly Val Ala Asn
            245             250             255

Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr Thr Thr Ser Val
            260             265             270

Pro Leu
```

```
<210>  66
<211>  154
<212>  PRT
<213>  Severe acute respiratory syndrome virus

<400>  66
```

```
Met Met Pro Thr Thr Leu Phe Ala Gly Thr His Ile Thr Met Thr Thr
1               5               10              15

Val Tyr His Ile Thr Val Ser Gln Ile Gln Leu Ser Leu Leu Lys Val
            20              25              30

Thr Ala Phe Gln His Gln Asn Ser Lys Lys Thr Thr Lys Leu Val Val
        35              40              45

Ile Leu Arg Ile Gly Thr Gln Val Leu Lys Thr Met Ser Leu Tyr Met
    50              55              60
```

```
Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser Leu His Lys Leu Leu
65              70              75                      80


Gln Thr Leu Val Leu Lys Met Leu His Ser Ser Ser Leu Thr Ser Leu
                85              90              95


Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln Ser Thr Ala Leu Gln
            100             105             110


Glu Leu Leu Ile Gln Gln Trp Ile Gln Phe Met Met Ser Arg Arg Arg
        115             120             125


Leu Leu Ala Cys Leu Cys Lys His Lys Lys Val Ser Thr Asn Leu Cys
    130             135             140


Thr His Ser Phe Arg Lys Lys Gln Val Arg
145             150
```

<210> 67
<211> 63
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 67

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Met Phe His Leu Val Asp Phe Gln Val Thr Ile Ala Glu Ile Leu Ile
1           5               10              15


Ile Ile Met Arg Thr Phe Arg Ile Ala Ile Trp Asn Leu Asp Val Ile
            20              25              30


Ile Ser Ser Ile Val Arg Gln Leu Phe Lys Pro Leu Thr Lys Lys Asn
        35              40              45


Tyr Ser Glu Leu Asp Asp Glu Glu Pro Met Glu Leu Asp Tyr Pro
    50              55              60
```

<210> 68
<211> 122
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 68

```
Met Lys Ile Ile Leu Phe Leu Thr Leu Ile Val Phe Thr Ser Cys Glu
1           5               10              15


Leu Tyr His Tyr Gln Glu Cys Val Arg Gly Thr Thr Val Leu Leu Lys
            20              25              30
```

Glu Pro Cys Pro Ser Gly Thr Tyr Glu Gly Asn Ser Pro Phe His Pro
        35   40   45

Leu Ala Asp Asn Lys Phe Ala Leu Thr Cys Thr Ser Thr His Phe Ala
     50   55   60

Phe Ala Cys Ala Asp Gly Thr Arg His Thr Tyr Gln Leu Arg Ala Arg
65   70   75   80

Ser Val Ser Pro Lys Leu Phe Ile Arg Gln Glu Glu Val Gln Gln Glu
             85   90   95

Leu Tyr Ser Pro Leu Phe Leu Ile Val Ala Ala Leu Val Phe Leu Ile
            100   105   110

Leu Cys Phe Thr Ile Lys Arg Lys Thr Glu
            115   120

<210> 69
<211> 44
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 69

Met Asn Glu Leu Thr Leu Ile Asp Phe Tyr Leu Cys Phe Leu Ala Phe
1   5   10   15

Leu Leu Phe Leu Val Leu Ile Met Leu Ile Ile Phe Trp Phe Ser Leu
            20   25   30

Glu Ile Gln Asp Leu Glu Glu Pro Cys Thr Lys Val
        35   40

<210> 70
<211> 39
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 70

Met Lys Leu Leu Ile Val Leu Thr Cys Ile Ser Leu Cys Ser Cys Ile
1   5   10   15

Cys Thr Val Val Gln Arg Cys Ala Ser Asn Lys Pro His Val Leu Glu
            20   25   30

Asp Pro Cys Lys Val Gln His
            35

<210> 71

<211> 84
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 71

Met Cys Leu Lys Ile Leu Val Arg Tyr Asn Thr Arg Gly Asn Thr Tyr
1   5   10   15

Ser Thr Ala Trp Leu Cys Ala Leu Gly Lys Val Leu Pro Phe His Arg
            20   25   30

Trp His Thr Met Val Gln Thr Cys Thr Pro Asn Val Thr Ile Asn Cys
        35   40   45

Gln Asp Pro Ala Gly Gly Ala Leu Ile Ala Arg Cys Trp Tyr Leu His
    50   55   60

Glu Gly His Gln Thr Ala Ala Phe Arg Asp Val Leu Val Val Leu Asn
65   70   75   80

Lys Arg Thr Asn

<210> 72
<211> 98
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 72

Met Asp Pro Asn Gln Thr Asn Val Val Pro Pro Ala Leu His Leu Val
1   5   10   15

Asp Pro Gln Ile Gln Leu Thr Ile Thr Arg Met Glu Asp Ala Met Gly
            20   25   30

Gln Gly Gln Asn Ser Ala Asp Pro Lys Val Tyr Pro Ile Ile Leu Arg
        35   40   45

Leu Gly Ser Gln Leu Ser Leu Ser Met Ala Arg Arg Asn Leu Asp Ser
    50   55   60

Leu Glu Ala Arg Ala Phe Gln Ser Thr Pro Ile Val Val Gln Met Thr
65   70   75   80

Lys Leu Ala Thr Thr Glu Glu Leu Pro Asp Glu Phe Val Val Val Thr
                85   90   95

Ala Lys

<210> 73
<211> 70
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 73

Met Leu Pro Pro Cys Tyr Asn Phe Leu Lys Glu Gln His Cys Gln Lys
1   5   10   15

Ala Ser Thr Gln Arg Glu Ala Glu Ala Ala Val Lys Pro Leu Leu Ala
            20   25   30

Pro His His Val Val Ala Val Ile Gln Glu Ile Gln Leu Leu Ala Ala
            35   40   45

Val Gly Glu Ile Leu Leu Leu Glu Trp Leu Ala Glu Val Val Lys Leu
        50   55   60

Pro Ser Arg Tyr Cys Cys
65   70

<210> 74
<211> 6
<212> RNA
<213> Coronavirus

<400> 74
cuaaac   6

<210> 75
<211> 13
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 75

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly
1   5   10

<210> 76
<211> 23
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 76

Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly Trp Leu Val Ile Gly
1   5   10   15

Val Ala Phe Leu Ala Val Phe
            20

<210> 77
<211> 23
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 77

Phe Gln Phe Ile Cys Asn Leu Leu Leu Leu Phe Val Thr Ile Tyr Ser
1   5   10   15

His Leu Leu Leu Val Ala Ala
            20

<210> 78
<211> 23
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 78

Ala Gln Phe Leu Tyr Leu Tyr Ala Leu Ile Tyr Phe Leu Gln Cys Ile
1   5   10   15

Asn Ala Cys Arg Ile Ile Met
            20

<210> 79
<211> 18
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 79

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
1   5   10   15

Ile Leu

<210> 80
<211> 23
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 80

Leu Leu Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp
1   5   10   15

Ile Met Leu Leu Gln Phe Ala
            20

<210> 81
<211> 23

<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 81

Leu Val Phe Leu Trp Leu Leu Trp Pro Val Thr Leu Ala Cys Phe Val
1   5   10   15

Leu Ala Ala Val Tyr Arg Ile
            20

<210> 82
<211> 23
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 82

Gly Gly Ile Ala Ile Ala Met Ala Cys Ile Val Gly Leu Met Trp Leu
1   5   10   15

Ser Tyr Phe Val Ala Ser Phe
            20

<210> 83
<211> 20
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 83

His Leu Val Asp Phe Gln Val Thr Ile Ala Glu Ile Leu Ile Ile Ile
1   5   10   15

Met Arg Thr Phe
            20

<210> 84
<211> 15
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 84

Met Lys Ile Ile Leu Phe Leu Thr Leu Ile Val Phe Thr Ser Cys
1   5   10   15

<210> 85
<211> 19
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 85

Ser Pro Leu Phe Leu Ile Val Ala Ala Leu Val Phe Leu Ile Leu Cys
1   5   10   15

Phe Thr Ile

<210> 86
<211> 83
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 86

Glu Leu Tyr His Tyr Gln Glu Cys Val Arg Gly Thr Thr Val Leu Leu
1   5   10   15

Lys Glu Pro Cys Pro Ser Gly Thr Tyr Glu Gly Asn Ser Pro Phe His
            20   25   30

Pro Leu Ala Asp Asn Lys Phe Ala Leu Thr Cys Thr Ser Thr His Phe
            35   40   45

Ala Phe Ala Cys Ala Asp Gly Thr Arg His Thr Tyr Gln Leu Arg Ala
    50   55   60

Arg Ser Val Ser Pro Lys Leu Phe Ile Arg Gln Glu Glu Val Gln Gln
65   70   75   80

Glu Leu Tyr

<210> 87
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 87
caggaaacag ctatgacacc aagaacaagg ctctcca   37

<210> 88
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 88
caggaaacag ctatgacgat agggcctctt ccacaga   37

<210> 89
<211> 496

<212> DNA
<213> Severe acute respiratory syndrome virus

<220>
<221> misc_feature
<222> (11)..(11)
<223> n is a, c, g, or t

<400> 89
acctacccag ngaaaagcca accaacctcg atctcttgta gatctgttct ctaaacgaac   60

tttaaaatct gtgtagctgt cgctcggctg catgcctagt gcacctacgc agtataaaca   120

ataataaatt ttactgtcgt tgacaagaaa cgagtaactc gtccctcttc tgcagactgc   180

ttacggtttc gtccgtgttg cagtcgatca tcagcatacc taggtttcgt ccgggtgtga   240

ccgaaaggta agatggagag ccttgttctt ggtgtcaacg agaaaacaca cgtccaactc   300

agtttgcctg tccttcaggt tagagacgtg ctagtgcgtg gcttcgggga ctctgtggaa   360

gaggccctat cggaggcacg tgaacacctc aaaaatggca cttgtggtct agtagagctg   420

gaaaaaggcg tactgcccca gcttgaacag ccctatgtgt tcattaaacg ttctgatgcc   480

ttaagcacca atcacg   496

<210> 90
<211> 523
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 90
gtcgacaaca atttctgtgg cccagatggg taccctcttg attgcatcaa agattttctc   60

gcacgcgcgg gcaagtcaat gtgcactctt tccgaacaac ttgattacat cgagtcgaag   120

agaggtgtct actgctgccg tgaccatgag catgaaattg cctggttcac tgagcgctct   180

gataagagct acgagcacca gacacccttc gaaattaaga gtgccaagaa atttgacact   240

ttcaaagggg aatgcccaaa gtttgtgttt cctcttaact caaaagtcaa agtcattcaa   300

ccacgtgttg aaaagaaaaa gactgagggt ttcatggggc gtatacgctc tgtgtaccct   360

gttgcatctc cacaggagtg taacaatatg cacttgtcta ccttgatgaa atgtaatcat   420

tgcgatgaag tttcatggca gacgtgcgac tttctgaaag ccacttgtga acattgtggc   480

actgaaaatt tagttattga aggacctact acatgtgggt acc   523

<210> 91
<211> 324
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 91
cttaggtgac gagcttggca ctgatcccat tgaagattat gaacaaaact ggaacactaa   60

gcatggcagt ggtgcactcc gtgaactcac tcgtgagctc aatggaggtg cagtcactcg   120

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ctatgtcgac aacaatttct gtggcccaga tgggtaccct cttgattgca tcaaagattt      180

tctcgcacgc gcgggcaagt caatgtgcac tctttccgaa caacttgatt acatcgagtc      240

gaagagaggt gtctactgct gccgtgacca tgagcatgaa attgcctggt tcactgagcg      300

ctcctgataa gagctacgag cacc                                             324
```

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<210>  92
<211>  495
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  92
tgctataata agcgtgccta ctgggttcct cgtgctagtg ctgatattgg gctcaggcca       60

tactggcatt actggtgaca atgtggagac cttgaatgag gatctccttg agatactgag      120

tcgtgaacgt gttaacatta acattgttgg cgattttcat ttgaatgaag aggttgccat      180

cattttggca tctttctctg cttctacaag tgcctttatt gacactataa agagtcttga      240

ttacaagtct ttcaaaacca ttgttgagtc ctgcggtaac tataaagtta ccaagggaaa      300

gcccgtaaaa ggtgcttgga acattggaca acagagatca gttttaacac cactgtgtgg      360

ttttcccttca caggctgctg tgttatcag atcaattttt gcgcgcacac ttgatgcagc      420

aaaccactca attcctgatt tgcaaagagc agctgtcacc atacttgatg gtatttctga      480

acagtcatta cgtct                                                       495
```

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<210>  93
<211>  486
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  93
gccactcaaa cattgaaact cgactccgca agggaggtag gactagatgt tttggaggct       60

gtgtgtttgc ctatgttggc tgctataata agcgtgccta ctgggttcct cgtgctagtg      120

ctgatattgg ctcaggccat actggcatta ctggtgacaa tgtggagacc ttgaatgagg      180

atctccttga gatactgagt cgtgaacgtg ttaacattaa cattgttggc gattttcatt      240

tgaatgaaga ggttgccatc attttggcat ctttctctgc ttctacaagt gcctttattg      300

acactataaa gagtcttgat tacaagtctt tcaaaaccat tgttgagtcc tgcggtaact      360

ataaagttac caagggaaag cccgtaaaag gtgcttggaa cattggacaa cagagatcag      420

ttttaacacc actgtgtggt tttcccctcac aggctgctgg tgttatcaga tcaatttttg      480

cgcgca                                                                 486
```

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<210>  94
<211>  567
<212>  DNA
```

<213> Severe acute respiratory syndrome virus

<400> 94

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cactactgtg gaaaaactca ggcctatctt tgaatggatt gaggcgaaac ttagtgcagg      60

agttgaattt ctcaaggatg cttgggagat tctcaaattt ctcattacag gtgtttttga     120

catcgtcaag ggtcaaatac aggttgcttc agataacatc aaggattgtg taaaatgctt     180

cattgatgtt gttaacaagg cactcgaaat gtgcattgat caagtcacta tcgctggcgc     240

aaagttgcga tcactcaact taggtgaagt cttcatcgct caaagcaagg actttaccg      300

tcagtgtata cgtggcaagg agcagctgca actactcatg cctcttaagg caccaaaaga     360

agtaaccttt cttgaaggtg attcacatga cacagtactt acctctgagg aggttgttct     420

caagaacggt gaactcgaag cactcgagac gcccgttgat agcttcacaa atggagctat     480

cgttggcaca ccagtctgtg taaatggcct catgctctta gagattaagg acaaagaaca     540

atactgcgca ttgtctcctg gtttact                                        567
```

<210> 95
<211> 516
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 95

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gggagattct caaatttctc attacaggtg ttttttgacat cgtcaagggt caaatacagg      60

ttgcttcaga taacatcaag gattgtgtaa aatgcttcat tgatgttgtt aacaaggcac     120

tcgaaatgtg cattgatcaa gtcactatcg ctggcgcaaa gttgcgatca ctcaacttag     180

gtgaagtctt catcgctcaa agcaagggac tttaccgtca gtgtatacgt ggcaaggagc     240

agctgcaact actcatgcct cttaaggcac caaaagaagt aacctttctt gaaggtgatt     300

cacatgacac agtacttacc tctgaggagg ttgttctcaa gaacggtgaa ctcgaagcac     360

tcgagacgcc cgttgatagc ttcacaaatg gagctatcgt tggcacacca gtctgtgtaa     420

atggcctcat gctcttagag attaaggaca agaacaata ctgcgcattg tctcctggtt     480

tactggctac aaacaatgtc tttcgcttaa aagggg                              516
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<210> 96
<211> 448
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 96

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agttcgagtt gaggaagaag aagaggaaga ctggctggat gatactactg agcaatcaga      60

gattgagcca gaaccagaac ctacacctga agaaccagtt aatcagttta ctggttattt     120

aaaacttact gacaatgttg ccattaaatg tgttgacatc gttaaggagg cacaaagtgc     180

taatcctatg gtgattgtaa atgctgctaa catacacctg aaacatggtg gtggtgtagc     240
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aggtgcactc aacaaggcaa ccaatggtgc catgcaaaag gagagtgatg attacattaa    300

gctaaatggc cctcttacag taggagggtc ttgtttgctt tctggacata atcttgctaa    360

gaagtgtctg catgttgttg gacctaacct aaatgcaggt gaggacatcc agcttcttaa    420

ggcagcatat gaaaatttca attcacag                                       448


<210>  97
<211>  333
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  97
agaggatgat tatcaaggtc tccctctgga atttggtgcc tcagctgaaa cagttcgagt     60

tgaggaagaa gaagaggaag actggctgga tgatactact gagcaatcag agattgagcc    120

agaaccagaa cctacacctg aagaaccagt taatcagttt actggttatt taaaacttac    180

tgacaatgtt gccattaaat gtgttgacat cgttaaggag gcacaaagtg ctaatcctat    240

ggtgattgta aatgctgcta acatacacct gaaacatggt ggtggtgtag caggtgcact    300

caacaaggca accaatggtg ccatgcaaaa gga                                 333


<210>  98
<211>  399
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  98
gagatgctct caagagcttt gaagaaagtg ccagttgatg agtatataac cacgtaccct     60

ggacaaggat gtgctggtta tacacttgag gaagctaaga ctgctcttaa gaaatgcaaa    120

tctgcatttt atgtactacc ttcagaagca cctaatgcta aggaagagat tctaggaact    180

gtatcctgga atttgagaga aatgcttgct catgctgaag agacaagaaa attaatgcct    240

atatgcatgg atgttagagc cataatggca accatccaac gtaagtataa aggaattaaa    300

attcaagagg gcatcgttga ctatggtgtc cgattcttct tttatactag taaagagcct    360

gtagcttcta ttattacgaa gctgaactct ctaaatgag                           399


<210>  99
<211>  437
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  99
agaaatctgt cgtacagaag cctgtcgatg tgaagccaaa aattaaggcc tgcattgatg     60

aggttaccac aacactggaa gaaactaagt ttcttaccaa taagttactc ttgtttgctg    120

atatcaatgg taagctttac catgattctc agaacatgct tagaggtgaa gatatgtctt    180

tccttgagaa ggatgcacct tacatggtag gtgatgttat cactagtggt gatatcactt    240
```

```
gtgttgtaat accctccaaa aaggctggtg gcactactga gatgctctca agagctttga      300

agaaagtgcc agttgatgag tatataacca cgtaccctgg acaaggatgt gctggttata      360

cacttgagga agctaagact gctcttaaga aatgcaaatc tgcattttat gtactacctt      420

cagaagcacc taatgct                                                     437
```


```
<210>    100
<211>    569
<212>    DNA
<213>    Severe acute respiratory syndrome virus

<400>    100
cctctatcgt attgacggag ctcaccttac aaagatgtca gagtacaaag gaccagtgac       60

tgatgttttc tacaaggaaa catcttacac tacaaccatc aagcctgtgt cgtataaact      120

cgatggagtt acttacacag agattgaacc aaaattggat gggtattata aaaaggataa      180

tgcttactat acagagcagc ctatagacct tgtaccaact caaccattac caaatgcgag      240

ttttgataat ttcaaactca catgttctaa cacaaaattt gctgatgatt aaatcaaat       300

gacaggcttc acaaagccag cttcacgaga gctatctgtc acattcttcc cagacttgaa      360

tggcgatgta gtggctattg actatagaca ctattcagcg agtttcaaga aaggtgctaa      420

attactgcat aagccaattg tttggcacat taaccaggct acaaccaaga caacgttcaa      480

accaaacact tggtgtttac gttgtctttg gagtacaaag ccagtagata cttcaaattc      540

atttgaagtt ctggcagtag aagacacat                                        569
```


```
<210>    101
<211>    187
<212>    DNA
<213>    Severe acute respiratory syndrome virus

<400>    101
tcagcagata cttcaaattc atttgaagtt ctggcagtag aagacacaca aggaatggac       60

aatcttgctt gtgaaagtca acaacccacc tctgaagaag tagtggaaaa tcctaccata      120

cagaaggaag tcatagagcg tgacgtgaaa actaccgaag ttgtaggcaa tgtcatactt      180

aaaccat                                                                187
```


```
<210>    102
<211>    271
<212>    DNA
<213>    Severe acute respiratory syndrome virus

<400>    102
aaatgcgacg agtctgcttc taagtctgct tctgtgtact acagtcagct gatgtgccaa       60

cctattctgt tgcttgacca agctcttgta tcagacgttg agatagtac tgaagtttcc      120

gttaagatgt ttgatgctta tgtcgacacc ttttcagcaa cttttagtgt tcctatggaa      180
```

```
aaacttaagg cacttgttgc tacagctcac agcgagttag caaagggtgt agctttagat      240

ggtgtccttt ctacattcgt gtcagctgcc c                                     271
```

```
<210> 103
<211> 363
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 103
catttcatca gcaattcttg gctcatgtgg tttatcatta gtattgtaca aatggcaccc       60

gtttctgcaa tggttaggat gtacatcttc tttgcttctt tctactacat atggaagagc      120

tatgttcata tcatggatgg ttgcacctct tcgacttgca tgatgtgcta taagcgcaat      180

cgtgccacac gcgttgagtg tacaactatt gttaatggca tgaagagatc tttctatgtc      240

tatgcaaatg gaggccgtgg cttctgcaag actcacaatt ggaattgtct caattgtgac      300

acattttgca ctggtagtac attcattagt gatgaagttg ctcgagattt gtcactccag      360

ttt                                                                    363
```

```
<210> 104
<211> 500
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 104
agagatcttg gcgcatgtat tgactgtaat gcaaggcata tcaatgccca aggtagcaaa       60

aagtcacaat gtttcactca tctggaatgt aaaagactac atgtctttat ctgaacagct      120

gcgtaaacaa attcgtagtg ctgccaagaa gaacaacata ccttttagac taacttgtgc      180

tacaactaga caggttgtca atgtcataac tactaaaatc tcactcaagg gtggtaagat      240

tgttagtact tgttttaaac ttatgcttaa ggccacatta ttgtgcgttc ttgctgcatt      300

ggtttgttat atcgttatgc cagtacatac attgtcaatc catgatggtt acacaaatga      360

aatcattggt tacaaagcca ttcaggatgg tgtcactcgt gacatcattt ctactgatga      420

ttgttttgca aataaacatg ctggtttttga cgcatggttt agccagcgtg gtggttcata      480

caaaaatgac aaaagctgcc                                                  500
```

```
<210> 105
<211> 537
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 105
cattgtcaat ccatgatggt tacacaaatg aaatcattgg ttacaaagcc attcaggatg       60

gtgtcactcg tgacatcatt tctactgatg attgttttgc aaataaacat gctggttttg      120

acgcatggtt tagccagcgt ggtggttcat acaaaaatga caaaagctgc cctgtagtag      180
```

```
ctgctatcat tacaagagag attggtttca tagtgcctgg cttaccgggt actgtgctga    240

gagcaatcaa tggtgacttc ttgcattttc tacctcgtgt ttttagtgct gttggcaaca    300

tttgctacac accttccaaa ctcattgagt atagtgattt tgctacctct gcttgcgttc    360

ttgctgctga gtgtacaatt tttaaggatg ctatgggcaa acctgtgcca tattgttatg    420

acactaattt gctagagggt tctatttctt atagtgagct cgtccagac actcgttatg    480

tgcttatgga tggttccatc atacagtttc ctaacactta cctggagggg tctgtta       537
```

```
<210>   106
<211>   427
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   106
cactttttgtt tttgatgtct ttcactatac tctgtctggt accagcttac agctttctgc     60

cgggagtcta ctcagtcttt tacttgtact tgacattcta tttcaccaat gatgtttcat    120

tcttggctca ccttcaatgg tttgccatgt tttctcctat tgtgccttt  tggataacag    180

caatctatgt attctgtatt tctctgaagc actgccattg gttctttaac aactatctta    240

ggaaaagagt catgtttaat ggagttacat ttagtacctt cgaggaggct gctttgtgta    300

ccttttttgct caacaaggaa atgtacctaa aattgcgtag cgagacactg ttgccactta    360

cacagtataa caggtatctt gctctatata acaagtacaa gtatttcagt ggagccttag    420

atactac                                                               427
```

```
<210>   107
<211>   537
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   107
agtaacaact tttgatgctg agtactgtag acatggtaca tgcgaaaggt cagaagtagg     60

tatttgccta tctaccagtg gtagatgggt tcttaataat gagcattaca gagctctatc    120

aggagttttc tgtggtgttg atgcgatgaa tctcatagct aacatcttta ctcctcttgt    180

gcaacctgtg ggtgctttag atgtgtctgc ttcagtagtg gctggtggta ttattgccat    240

attggtgact tgtgctgcct actactttat gaaattcaga cgtgtttttg gtgagtacaa    300

ccatgttgtt gctgctaatg cactttttgtt tttgatgtct ttcactatac tctgtctggt    360

accagcttac agctttctgc cgggagtcta ctcagtcttt tacttgtact tgacattcta    420

tttcaccaat gatgtttcat tcttggctca ccttcaatgg tttgccatgt tttctcctat    480

tgtgccttt  tggataacag caatctatgt attctgtatt tctctgaagc actgcca       537
```

```
<210>   108
<211>   551
```

```
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  108
agtatactgt ccaagacatg tcatttgcac agcagaagac atgcttaatc ctaactatga      60

agatctgctc attcgcaaat ccaaccatag ctttcttgtt caggctggca atgttcaact     120

tcgtgttatt ggccattcta tgcaaaattg tctgcttagg cttaaagttg atacttctaa     180

ccctaagaca cccaagtata aatttgtccg tatccaacct ggtcaaacat tttcagttct     240

agcatgctac aatggttcac catctggtgt ttatcagtgt gccatgagac ctaatcatac     300

cattaaaggt tctttcctta atggatcatg tggtagtgtt ggttttaaca ttgattatga     360

ttgcgtgtct ttctgctata tgcatcatat ggagcttcca acaggagtac acgctggtac     420

tgacttagaa ggtaaattct atggtccatt tgttgacaga caaactgcac aggctgcagg     480

tacagacaca accataacat aaatgttttt ggcatggctg tatgctgctg ttatcaatgg     540

tgataggtgg t                                                         551


<210>  109
<211>  593
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  109
acttagcaaa ggctctaaat gactttagca actcaggtgc tgatgttctc taccaaccac      60

cacagacatc aatcacttct gctgttctgc agagtggttt taggaaaatg gcattcccgt     120

caggcaaagt tgaagggtgc atggtacaag taacctgtgg aactacaact cttaatggat     180

tgtggttgga tgacacagta tactgtccaa gacatgtcat ttgcacagca gaagacatgc     240

ttaatcctaa ctatgaagat ctgctcattc gcaaatccaa ccatagcttt cttgttcagg     300

ctggcaatgt tcaacttcgt gttattggcc attctatgca aaattgtctg cttaggctta     360

aagttgatac ttctaaccct aagacaccca gtataaatt tgtccgtatc caacctggtc     420

aaacattttc agttctagca tgctacaatg gttcaccatc tggtgtttat cagtgtgcca     480

tgagacctaa tcataccatt aaaggttctt ccttaatgg atcatgtggt agtgttggtt     540

ttaacattga ttatgattgc gtgtctttct gctatatgca tcatatggag ctt           593


<210>  110
<211>  504
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  110
tgtgctgctt tgaaagagct gctgcagaat gggtatgaat ggtcgtacta tccttggtag      60

cactatttta gaagatgagt ttacaccatt tgatgttgtt agacaatgct ctggtgttac     120

cttccaaggg taagttcaag aaaattgtta agggcactca tcattggatg cttttaactt     180
```

```
tcttgacatc actattgatt cttgttcaaa gtacacagtg gtcactgttt ttctttgttt    240

acgagaatgc tttcttgcca tttactcttg gtattatggc aattgctgca tgtgctatgc    300

tgcttgttaa gcataagcac gcattcttgt gcttgtttct gttaccttct cttgcaacag    360

ttgcttactt taatatggtc tacatgcctg ctagctgggt gatgcgtatc atgacatggc    420

ttgaattggc tgacactagc ttgtctggtt ataggcttaa ggattgtgtt atgtatgctt    480

cagctttagt tttgcttatt ctca                                          504
```

```
<210>   111
<211>   298
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   111
taggcttaag gattgtgtta tgtatgcttc agctttagtt ttgcttattc tcatgacagc     60

tcgcactgtt tatgatgatg ctgctagacg tgtttggaca ctgatgaatg tcattacact    120

tgtttacaaa gtctactatg gtaatgcttt agatcaagct atttccatgt gggccttagt    180

tatttctgta acctctaact attctggtgt cgttacgact atcatgtttt tagctagagc    240

tatagtgttt gtgtgtgttg agtattaccc attgttattt attacctggc aacacctt     298
```

```
<210>   112
<211>   530
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   112
aaacaggcaa gatctgagga caagagggca aaagtaacta gtgctatgca aacaatgctc     60

ttcactatgc ttaggaagct tgataatgat gcacttaaca acattatcaa caatgcgcgt    120

gatggttgtg ttccactcaa catcatacca ttgactacag cagccaaact catggttgtt    180

gtccctgatt atggtaccta caagaacact tgtgatggta acacctttac atatgcatct    240

gcactctggg aaatccagca agttgttgat gcggatagca agattgttca acttagtgaa    300

attaacatgg acaattcacc aaatttggct tggcctctta ttgttacagc tctaagagcc    360

aactcagctg ttaaactaca gaataatgaa ctgagtccag tagcactacg acagatgtcc    420

tgtgcggctg gtaccacaca aacagcttgt actgatgaca atgcacttgc ctactataac    480

aattcgaagg gaggtaggtt tgtgctggca ttactatcag accaccaagc               530
```

```
<210>   113
<211>   605
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   113
gaagtcgttc tcaaaaagtt aaagaaatct ttgaatgtgg ctaaatctga gtttgaccgt     60
```

```
gatgctgcca tgcaacgcaa gttggaaaag atggcagatc aggctatgac ccaaatgtac      120

aaacaggcaa gatctgagga caagagggca aaagtaacta gtgctatgca acaatgctc      180

ttcactatgc ttaggaagct tgataatgat gcacttaaca acattatcaa caatgcgcgt      240

gatggttgtg ttccactcaa catcatacca ttgactacag cagccaaact catggttgtt      300

gtccctgatt atggtaccta caagaacact tgtgatggta caccttttac atatgcatct      360

gcactctggg aaatccagca agttgttgat gcggatagca agattgttca acttagtgaa      420

attaacatgg acaattcacc aaatttggct tggcctctta ttgttacagc tctaagagcc      480

aactcagctg ttaaactaca gaataatgaa ctgagtccag tagcactacg acagatgtcc      540

tgtgcggctg gtaccacaca aacagcttgt actgatgaca atgcacttgc ctactataac      600

aattc                                                                   605
```

```
<210>   114
<211>   176
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   114
acactggtac aggacaggca attactgtaa caccagaagc taacatggac caagagtcct       60

ttggtggtgc ttcatgttgt ctgtattgta gatgccacat tgaccatcca aatcctaaag      120

gattctgtga cttgaaaggt aagtacgtcc aaatacctac cacttgtgct aatgat          176
```

```
<210>   115
<211>   516
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   115
actgtaacac cagaagctaa catggaccaa gagtcctttg gtggtgcttc atgttgtctg       60

tattgtagat gccacattga ccatccaaat cctaaaggat tctgtgactt gaaaggtaag      120

tacgtccaaa tacctaccac ttgtgctaat gacccagtgg gttttacact tagaaacaca      180

gtctgtaccg tctgcggaat gtggaaaggt tatggctgta gttgtgacca actccgcgaa      240

cccttgatgc agtctgcgga tgcatcaacg tttttaaacg ggtttgcggt gtaagtgcag      300

cccgtcttac accgtgcggc acaggcacta gtactgatgt cgtctacagg gcttttgata      360

tttacaacga aaaagttgct ggttttgcaa agttcctaaa aactaattgc tgtcgcttcc      420

aggagaagga tgaggaaggc aatttattag actcttactt tgtagttaag aggcatacta      480

tgtctaccta ccaacatgaa gagactattt ataact                                516
```

```
<210>   116
<211>   366
<212>   DNA
```

<213> Severe acute respiratory syndrome virus

<400> 116
accacttatt aagtgggatt tgctgaaata tgattttacg gaagagagac tttgtctctt   60

cgaccgttat tttaaatatt gggaccagac ataccatccc aattgtatta actgtttgga   120

tgataggtgt atccttcatt gtgcaaactg taatgtgtta ttttctgctg tgtttccacg   180

tacaagtttt ggaccactag taagaaaaat atttgtagat ggtgttcctt ttgttgtttc   240

aactggatac cattttcgtg agttaggagt cgtacataat caggatgtaa acttacatag   300

ctcgcgtctc agtttcaagg aactttagt gtatgctgct gatccagcta tgcatgcagc   360

ttctgg   366

<210>   117
<211>   291
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   117
tgaaaaagtt gctggttttg caaagttcct aaaaactaat tgctgtcgct tccaggagaa   60

ggatgaggaa ggcaatttat tagactctta ctttgtagtt aagaggcata ctatgtctaa   120

ctaccaacat gaagagacta tttataactt ggttaaagat tgtccagcgg ttgctgtcca   180

tgactttttc aagtttagag tagatggtga catggtacca catatatcac gtcagcgtct   240

aactaaatac acaatggctg atttagtcta tgctctacgt cattttgatg a   291

<210>   118
<211>   480
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   118
gagtcccata tggatgctga tctcgcaaaa ccacttatta agtgggattt gctgaaatat   60

gattttacgg aagagagact ttgtctcttc gaccgttatt ttaaatattg ggaccagaca   120

taccatccca attgtattaa ctgtttggat gataggtgta tccttcattg tgcaaacttt   180

aatgtgttat tttctactgt gtttccacct acaagttttg gaccactagt aagaaaaata   240

tttgtagatg gtgttccttt tgttgtttca actggatacc attttcgtga gttaggagtc   300

gtacataatc aggatgtaaa cttacatagc tcgcgtctca gtttcaagga acttttagtg   360

tatgctgctg atccagctat gcatgcagct tctggcaatt tattgctaga taaacgcact   420

acatgctttt cagtagctgc actaacaaac aatgttgctt ttcaaactgt caaacccggt   480

<210>   119
<211>   405
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400> 119

```
aatgggaact ggtacgattt cggtgatttc gtacaagtag caccaggctg cggagttcct      60

attgtggatt catattactc attgctgatg cccatcctca ctttgactag ggcattggct     120

gctgagtccc atatggatgc tgatctcgca aaaccactta ttaagtgaga tttgctgaaa     180

tatgatttta cggaagagag actttgtctc ttcgaccgtt attttaaata ttgggaccag     240

acataccatc ccaattgtat taactgtttg gatgataggt gtatccttca ttgtgcaaac     300

tttaatgtgt tattttctac tgtgtttcca cctacaagct ttggaccact agtaagaaaa     360

atatttgtag atggtgttcc ttttgttgtt tcaactggat accat                     405
```

<210> 120
<211> 562
<212> DNA
<213> Severe acute respiratory syndrome virus

<220>
<221> misc_feature
<222> (67)..(67)
<223> n is a, c, g, or t

<400> 120

```
ctattgatgc ttacccactt acaaaacatc ctaatcagga gtatgctgat gtctttcact      60

tgtattnaca atacattaga aagttacatg atgagcttac tggccacatg ttggacatgt     120

attccgtaat gctaactaat gataacacct cacggtactg ggaacctgag ttttatgagg     180

ctatgtacac accacataca gtcttgcagg ctgtaggtgc ttgtgtattg tgcaattcac     240

agacttcact tcgttgcggt gcctgtatta ggagaccatt cctatgttgc aagtgctgct     300

atgaccatgt catttcaaca tcacacaaat tagtgttgtc tgttaatccc tatgtttgca     360

atgccccagg ttgtgatgtc actgatgtga cacaactgta tctaggaggt atgagctatt     420

attgcaagtc acataagcct cccattagtt ttccattatg tgctaatggt caggtttttg     480

gtttatacaa aaacacatgt gtaggcagtg acaatgtcac tgacttcaat gcgatagcaa     540

catgtgattg gactaatgct gg                                              562
```

<210> 121
<211> 580
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 121

```
gctatgtaca caccacatac agtcttgcag gctgtaggtg cttgtgtatt gtgcaattca      60

cagacttcac ttcgttgcgg tgcctgtatt aggagaccat tcctatgttg caagtgctgc     120

tatgaccatg tcatttcaac atcacacaaa ttagtgttgt ctgttaatcc ctatgtttgc     180

aatgccccag gttgtgatgt cactgatgtg acacaactgt atctaggagg tatgagctat     240
```

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```
tattgcaagt cacataagcc tcccattagt tttccattat gtgctaatgg tcaggttttt    300

ggtttataca aaaacacatg tgtaggcagt gacaatgtca ctgacttcaa tgcgatagca    360

acatgtgatt ggactaatgc tggcgattac atacttgcca acacttgtac tgagagactc    420

aagcttttcg cagcagaaac gctcaaagcc actgaggaaa catttaagct gtcatatggt    480

attgccactg tacgcgaagt actctctgac agagaattgc atctttcatg ggaggttgga    540

aaacctagac caccattgaa cagaaactat gtctttactg                          580
```

```
<210>  122
<211>  610
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  122
tggtgatgct gttgtgtaca gaggtactac gacatacaag ttgaatgttg gtgattactt     60

tgtgttgaca tctcacactg taatgccact tagtgcacct actctagtgc cacaagagca    120

ctatgtgaga attactggct tgtacccaac actcaacatc tcagatgagt tttctagcaa    180

tgttgcaaat tatcaaaagg tcggcatgca aaagtactct acactccaag gaccacctgg    240

tactggtaag agtcattttg ccatcggact tgctctctat tacccatctg ctcgcatagt    300

gtatacggca tgctctcatg cagctgttga tgccctatgt gaaaaggcat taaaatattt    360

gcccatagat aaatgtagta gaatcatacc tgcgcgtgcg cgcgtagagt gttttgataa    420

attcaaagtg aattcaacac tagaacagta tgttttctgc actgtaaatg cattgccaga    480

aacaactgct gacattgtag tctttgatga aatctctatg ctactaatt atgacttgag     540

tgttgtcaat gctagacttc gtgcaaaaca ctacgtctat attggcgatc ctgctcaatt    600

accagcccct                                                            610
```

```
<210>  123
<211>  429
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  123
ccaacactca acatctcaga tgagttttct agcaatgttg caaattatca aaaggtcggc     60

atgcaaaagt actctacact ccaaggacca cctggtactg gtaagagtca ttttgccatc    120

ggacttgctc tctattaccc atctgctcgc atagtgtata cggcatgctc tcatgcagct    180

gttgatgccc tatgtgaaaa ggcattaaaa tatttgccca tagataaatg tagtagaatc    240

atacctgcgc gtgcgcgcgt agagtgtttt gataaattca agtgaattc aacactagaa     300

cagtatgttt tctgcactgt aaatgcattg ccagaaacaa ctgctgacat tgtagtcttt    360

gatgaaatct ctatggctac taattatgac ttgagtgttg tcaatgctag acttcgtgca    420

aaacactac                                                            429
```

<210> 124
<211> 486
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 124
caatgtggct atcacaaggg caaaaattgg cattttgtgc ataatgtctg atagagatct   60

ttatgacaaa ctgcaattta caagtctaga aataccacgt cgcaatgtgg ctacattaca   120

agcagaaaat gtaactggac tttttaagga ctgtagtaag atcattactg gtcttcatcc   180

tacacaggca cctacacacc tcagcgttga tataaagttc aagactgaag gattatgtgt   240

tgacatacca ggcataccaa aggacatgac ctaccgtaga ctcatctcta tgatgggttt   300

caaaatgaat taccaagtca atggttaccc taatatgttt atcacccgcg aagaagctat   360

tcgtcacgtt cgtgcgtgga ttggctttga tgtagagggc tgtcatgcaa ctagagatgc   420

tgtgggtact aacctacctc tccagctagg attttctaca ggtgttaact tagtagctgt   480

accgac   486

<210> 125
<211> 427
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 125
aaaggacatg acctaccgta gactcatctc tatgatgggt ttcaaaatga attaccaagt   60

caatggttac cctaatatgt ttatcacccg cgaagaagct attcgtcacg ttcgtgcgtg   120

gattggcttt gatgtagagg gctgtcatgc aactagagat gctgtgggta ctaacctacc   180

tctccagcta ggattttcta caggtgttaa cttagtagct gtaccgactg gttatgttga   240

cactgaaaat aacacagaat tcaccagagt taatgcaaaa cctccaccag gtgaccagtt   300

taaacatctt ataccactca tgtataaagg cttgccctgg aatgtagtgc gtattaagat   360

agtacaaatg ctcagtgata cactgaaagg attgtcagac agagtcgtgt cgtcctttg   420

ggcgcat   427

<210> 126
<211> 392
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 126
atggaaatgc acatgtggct agttgtgatg ctatcatgac tagatgttta gcagtccatg   60

agtgctttgt taagcgcgtt gattggtctg ttgaataccc tattatagga gatgaactga   120

gggttaattc tgcttgcaga aaagtacaac acatggttgt gaagtctgca ttgcttgctg   180

ataagtttcc agttcttcat gacattggaa atccaaaggc tatcaagtgt gtgcctcagg   240

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ctgaagtaga atggaagttc tacgatgctc agccatgtag tgacaaagct tacaaaatag   300

aggaactctt ctattcttat gctacacatc acgataaatt cactgatggt gtttgtttgt   360

tttggaattg taacgttgat cgttacccag cc   392

<210>   127
<211>   483
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   127
gcttcatcag atacttatgc ctgctggaat cattctgtgg gttttgacta tgtctataac   60

ccatttatga ttgatgttca gcagtggggc tttacgggta accttcagag taaccatgac   120

caacattgcc aggtacatgg aaatgcacat gtggctagtt gtgatgctat catgactaga   180

tgtttagcag tccatgagtg ctttgttaag cgcgttgatt ggtctgttga ataccctatt   240

ataggagatg aactgagggt taattctgct tgcagaaaag tacaacacat ggttgtgaag   300

tctgcattgc ttgctgataa gtttccagtt cttcatgaca ttggaaatcc aaaggctatc   360

aagtgtgtgc ctcaggctga agtagaatgg aagttctacg atgctcagcc atgtagtgac   420

aaagcttaca aaatagagga actcttctat tcttatgcta cacatcacga taaattcact   480

gat   483

<210>   128
<211>   326
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   128
tcaaagggac cagcacaagc tagcgtcaat ggagtcacat taattggaga atcagtaaaa   60

acacagtttta actactttaa gaaagtagac ggcattattc aacagttgcc tgaaacctac   120

tttactcaga gcagagactt agaggatttt aagcccagat cacaaatgga aactgacttt   180

ctcgagctcg ctatggatga attcatacag cgatataagc tcgagggcta tgccttcgaa   240

cacatcgttt atggagattt cagtcatgga caacttggcg gtcttcattt aatgataggc   300

ttagccaagc gctcacaaga ttcact   326

<210>   129
<211>   457
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   129
acaccttcaa agggaccagc acaagctagc gtcaatggag tcacattaat tggagaatca   60

gtaaaaacac agtttaacta ctttaagaaa gtagacggca ttattcaaca gttgcctgaa   120

acctacttta ctcagagcag agacttagag gattttaagc ccagatcaca aatggaaact   180

```
gactttctcg agctcgctat ggatgaattc atacagcgat ataagctcga gggctatgcc        240

ttcgaacaca tcgtttatgg agatttcagt catggacaac ttggcggtct tcatttaatg        300

ataggcttag ccaagcgctc acaagattca ccacttaaat tagaggattt tatccctatg        360

gacagcacag tgaaaaatta cttcataaca gatgcgcaaa caggttcatc aaaatgtgtg        420

tgttctgtga ttgatctttt acttgatgac tttgtcg                                457
```

<210> 130
<211> 493
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 130
```
cgcaaagtat actcaactgt gtcaatactt aaatacactt actttagctg taccctacaa         60

catgagagtt attcactttg gtgctggctc tgataaagga gttgcaccag gtacagctgt        120

gctcagacaa tggttgccaa ctggcacact acttgtcgat tcagatctta atgacttcgt        180

ctccgacgca gattctactt taattggaga ctgtgcaaca gtacatacgg ctaataaatg        240

ggaccttatt attagcgata tgtatgaccc taggaccaaa catgtgacaa aagagaatga        300

ctctaaagaa gggttttca cttatctgtg tggatttata aagcaaaaac tagccctggg        360

tggttctata gctgtaaaga taacagagca ttcttggaat gctgaccttt acaagcttat        420

gggccatttc tcatggtgga cagcttttgt tacaaatgta aatgcatcat catcggaagc        480

attttaatt ggg                                                           493
```

<210> 131
<211> 490
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 131
```
acttaaatac acttacttta gctgtaccct acaacatgag agttattcac tttggtgctg         60

gctctgataa aggagttgca ccaggtacag ctgtgctcag acaatggttg ccaactggca        120

cactacttgt cgattcagat cttaatgact cgtctccga cgcagattct actttaattg        180

gagactgtgc aacagtacat acggctaata atgggacct tattattagc gatatgtatg        240

accctaggac caaacatgtg acaaaagaga atgactctaa agaagggttt ttcacttatc        300

tgtgtggatt tataaagcaa aaactagccc tgggtggttc tatagctgta aagataacag        360

agcattcttg gaatgctgac ctttacaagc ttatgggcca tttctcatgg tggacagctt        420

ttgttacaaa tgtaaatgca tcatcatcgg aagcattttt aattggggct aactatcttg        480

gcaagccgaa                                                               490
```

<210> 132

<211> 550
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 132
taaggagaat caaatcaatg atatgattta ttctcttctg gaaaaaggta ggcttatcat   60

tagagaaaac aacagagttg tggtttcaag tgatattctt gttaacaact aaacgaacat   120

gtttattttc ttattatttc ttactctcac tagtggtagt gaccttgacc ggtgcaccac   180

ttttgatgat gttcaagctc ctaattacac tcaacatact tcatctatga gggggggttta   240

ctatcctgat gaaatttta gatcagacac tctttattta actcaggatt tatttcttcc   300

attttattct aatgttacag ggtttcatac tattaatcat acgtttggca accctgtcat   360

accttttaag gatggtattt attttgctgc cacagagaaa tcaaatgttg tccgtggttg   420

ggttttggt tctaccatga caacaagtc acagtcggtg attattatta caattctac   480

taatgttgtt atacgagcat gtaactttga attgtgtgac aacccttct ttgctgtttc   540

taaacccata   550

<210> 133
<211> 490
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 133
acttaaatac acttacttta gctgtaccct acaacatgag agttattcac tttggtgctg   60

gctctgataa aggagttgca ccaggtacag ctgtgctcag acaatggttg ccaactggca   120

cactacttgt cgattcagat cttaatgact tcgtctccga cgcagattct actttaattg   180

gagactgtgc aacagtacat acggctaata aatgggacct tattattagc gatatgtatg   240

accctaggac caaacatgtg acaaaagaga atgactctaa agaagggttt ttcacttatc   300

tgtgtggatt tataaagcaa aaactagccc tgggtggttc tatagctgta aagataacag   360

agcattcttg gaatgctgac ctttacaagc ttatgggcca tttctcatgg tggacagctt   420

ttgttacaaa tgtaaatgca tcatcatcgg aagcattttt aattggggct aactatcttg   480

gcaagccgaa   490

<210> 134
<211> 550
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 134
taaggagaat caaatcaatg atatgattta ttctcttctg gaaaaaggta ggcttatcat   60

tagagaaaac aacagagttg tggtttcaag tgatattctt gttaacaact aaacgaacat   120

gtttattttc ttattatttc ttactctcac tagtggtagt gaccttgacc ggtgcaccac   180

```
ttttgatgat gttcaagctc ctaattacac tcaacatact tcatctatga gggggtttta    240

ctatcctgat gaaattttta gatcagacac tctttattta actcaggatt tatttcttcc    300

attttattct aatgttacag ggtttcatac tattaatcat acgtttggca accctgtcat    360

accttttaag gatggtattt attttgctgc cacagagaaa tcaaatgttg tccgtggttg    420

ggtttttggt tctaccatga caacaagtc acagtcggtg attattatta caattctac    480

taatgttgtt atacgagcat gtaactttga attgtgtgac aaccctttct ttgctgtttc    540

taaacccata                                                           550
```

```
<210>  135
<211>  400
<212>  DNA
<213>  Severe acute respiratory syndrome virus
```

```
<400>  135
atcaatgata tgatttattc tcttctggaa aaaggtaggc ttatcattag agaaaacaac     60

agagttgtgg tttcaagtga tattcttgtt aacaactaaa cgaacatgtt tattttctta    120

ttatttctta ctctcactag tggtagtgac cttgaccggt gcaccacttt tgatgatgtt    180

caagctccta attacactca acatacttca tctatgaggg gggtttacta tcctgatgaa    240

atttttagat cagacactct ttatttaact caggatttat ttcttccatt ttattctaat    300

gttacagggt ttcatactat taatcatacg tttggcaacc ctgtcatacc ttttaaggat    360

ggtatttatt ttgctgccac agagaaatca aatgttgtcc                           400
```

```
<210>  136
<211>  288
<212>  DNA
<213>  Severe acute respiratory syndrome virus
```

```
<400>  136
tgatctttgc ttctccaatg tctatgcaga ttctttggta gtcaagggag atgatgtaag     60

acaaatagcg ccaggacaaa ctggtgttat tgctgattat aattataaat tgccagatga    120

tttcatgggt tgtgtccttg cttggaatac taggaacatt gatgctactt caactggtaa    180

ttataattat aaaatataggt atcttagaca tggcaagctt aggccctttg agagagacat    240

atctaatgtg cctttctcca cctgatggca aaccttgcac cccacctg                  288
```

```
<210>  137
<211>  411
<212>  DNA
<213>  Severe acute respiratory syndrome virus
```

```
<400>  137
ctttgagaga gacatatcta atgtgccttt ctcccctgat ggcaaacctt gcaccccacc     60

tgctcttaat tgttattggc cattaaatga ttatggtttt tacaccacta ctggcattgg    120
```

```
ctaccaacct tacagagttg tagtactttc ttttgaactt ttaaatgcac cggccacggt      180

ttgtggacca aaattatcca ctgacctat taagaaccag tgtgtcaatt ttaatttaa       240

tggactcact ggtactggtg tgttaactcc ttcttcaaag agatttcaac catttcaaca     300

aattttgccg tgatgtttct gatttcactg attccgttcg agatcctaaa acatctgaaa     360

tattagacat ttcaccctgc gcttttgggg gtgtaagtgt aattacacct g             411
```

<210> 138
<211> 357
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 138
```
tggaaatatt ttggtggttt taatttttca caaatattac ctgaccctct aaagccaact      60

aagaggtctt ttattgagga cttgctcttt aataaggtga cactcgctga tgctggcttc      120

atgaagcaat atggcgaatg cctaggtgat attaatgcta gagatctcat ttgtgcgcag     180

aagttcaatg gacttacagt gttgccacct ctgctcactg atgatatgat tgctgcctac     240

actgctgctc tagttagtgg tactgccact gctggatgga catttggtgc tggcgctgct     300

cttcaaatac cttttgctat gcaaatggca tataggttca atggcattgg agttact        357
```

<210> 139
<211> 434
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 139
```
caatatggcg aatgcctagg tgatattaat gctagagatc tcatttgtgc gcagaagttc      60

aatggactta cagtgttgcc acctctgctc actgatgata tgattgctgc ctacactgct      120

gctctagtta gtggtactgc cactgctgga tggacatttg gtgctggcgc tgctcttcaa     180

ataccttttg ctatgcaaat ggcatatagg ttcaatggca ttggagttac ccaaaatgtt     240

ctctatgaga accaaaaaca aatcgccaac caatttaaca aggcgattag tcaaattcaa     300

gaatcactta caacaacatc aactgcattg ggcaagctgc aagacgttgt taaccagaat     360

gctcaagcat aaacacact tgttaaacaa cttagctcta attttggtgc aatttcaagt      420

gtgctaaatg atat                                                     434
```

<210> 140
<211> 557
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 140
```
acagacaata catttgtctc aggaaattgt gatgtcgtta ttggcatcat aacaacaca       60

gtttatgatc ctctgcaacc tgagcttgac tcattcaaag aagagctgga caagtacttc     120
```

```
aaaaatcata catcaccaga tgttgatctt ggcgacattt caggcattaa cgcttctgtc    180

gtcaacattc aaaaagaaat tgaccgcctc aatgaggtcg ctaaaaattt aaatgaatca    240

ctcattgacc ttcaagaatt gggaaaatat gagcaatata ttaaatggcc ttggtatgtt    300

tggctcggct tcattgctgg actaattgcc atcgtcatgg ttacaatctt gctttgttgc    360

atgactagtt gttgcagttg cctcaagggt gcatgctctt gtggttcttg ctgcaagttt    420

gatgaggatg actctgagcc agttctcaag ggtgtcaaat tacattacac ataaacgaac    480

ttatggattt gtttatgaga ttttttactc ttagatcaat tactgcacag ccagtaaaaa    540

ttgacaatgc ttctcct                                                   557
```

<210> 141
<211> 530
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 141
```
atgtttggct cggcttcatt gctggactaa ttgccatcgt catggttaca atcttgcttt     60

gttgcatgac tagttgttgc agttgcctca agggtgcatg ctcttgtggt tcttgctgca    120

agtttgatga ggatgactct gagccagttc tcaagggtgt caaattacat tacacataaa    180

cgaacttatg gatttgttta tgagattttt tactcttaga tcaattactg cacagccagt    240

aaaaattgac aatgcttctc ctgcaagtac tgttcatgct acagcaacga taccgctaca    300

agcctcactc cctttcggat ggcttgttat tggcgttgca tttcttgctg tttttcagag    360

cgctaccaaa ataattgcgc tcaataaaag atggcagcta gccctttata agggcttcca    420

gttcatttgc aatttactgc tgctatttgt taccatctat tcacatcttt tgcttgtcgc    480

tgcaggtatg gaggcgcaat ttttgtacct ctatgccttg atatattttc              530
```

<210> 142
<211> 320
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 142
```
ttgctcgtac ccgctcaatg tggtcattca acccagaaac aaacattctt ctcaatgtgc     60

ctctccgggg gacaattgtg accagaccgc tcatggaaag tgaacttgtc attggtgctg    120

tgatcattcg tggtcacttg cgaatggccg acactccct agggcgctgt gacattaagg     180

acctgccaaa agagatcact gtggctacat cacgaacgct ttcttattac aaattaggag    240

cgtcgcagcg tgtaggcact gattcaggtt ttgctgcata caaccgctac cgtattggaa    300

actataaatt aaatacagac                                                320
```

<210> 143
<211> 417
```

<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 143

```
cgaacttatg tactcattcg tttcggaaga aacaggtacg ttaatagtta atagcgtact    60

tcttttttctt gctttcgtgg tattcttgct agtcacacta gccatcctta ctgcgcttcg   120

attgtgtgcg tactgctgca atattgttaa cgtgagttta gtaaaaccaa cggtttacgt   180

ctactcgcgt gttaaaaatc tgaactcttc tgaaggagtt cctgatcttc tggtctaaac   240

gaactaacta ttattattat tctgtttgga actttaacat tgcttatcat ggcagacaac   300

ggtactatta ccgttgagga gcttaaacaa ctcctggaac aatggaacct agtaataggt   360

ttcctattcc tagcctggat tatgttacta caatttgcct attctaatcg gaacagg       417
```

<210> 144
<211> 516
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 144

```
cttgtcattg gtgctgtgat cattcgtggt cacttgcgaa tggccggaca ctccctaggg    60

cgctgtgaca ttaaggacct gccaaaagag atcactgtgg ctacatcacg aacgctttct   120

tattacaaat taggagcgtc gcagcgtgta ggcactgatt caggttttgc tgcatacaac   180

cgctaccgta ttggaaacta taaattaaat acagaccacg ccggtagcaa cgacaatatt   240

gctttgctag tacagtaagt gacaacagat gtttcatctt gttgacttcc aggttacaat   300

agcagagata ttgattatca ttatgaggac tttcaggatt gctatttgga atcttgacgt   360

tataataagt tcaatagtga gacaattatt taagcctcta actaagaaga attattcgga   420

gttagatgat gaagaaccta tggagttaga ttatccataa aacgaacatg aaaattattc   480

tcttcctgac attgatttta tttacatctt gcgagc                             516
```

<210> 145
<211> 310
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 145

```
cgatgtttca tcttgttgac ttccaggtta caatagcaga gatattgatt atcattatga    60

ggactttcag gattgctatt tggaatcttg acgttataat aagttcaata gtgagacaat   120

tatttaagcc tctaactaag aagaattatt cggagttaga tgatgaagaa cctatggagt   180

tagattatcc ataaaacgaa catgaaaatt attctcttcc tgacattgat tgtatttaca   240

tcttgcgagc tatatcacta tcaggagtgt gttagaggta cgactgtact actaaaagaa   300

ccttgcccat                                                          310
```

<210> 146
<211> 556
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 146
agaaagacag aatgaatgag ctcactttaa ttgacttcta tttgtgcttt ttagcctttc   60

tgctattcct tgttttaata atgcttatta tattttggtt ttcactcgaa atccaggatc   120

tagaagaacc ttgtaccaaa gtctaaacga acatgaaact tctcattgtt ttgacttgta   180

tttctctatg cagttgcata tgcactgtag tacagcgctg tgcatctaat aaacctcatg   240

tgcttgaaga tccttgtaag gtacaacact aggggtaata cttatagcac tgcttggctt   300

tgtgctctag gaaaggtttt accttttcat agatggcaca ctatggttca aacatgcaca   360

cctaatgtta ctatcaactg tcaagatcca gctggtggtg cgcttatagc taggtgttgg   420

taccttcatg aaggtcacca aactgctgca tttagagacg tacttgttgt tttaaataaa   480

cgaacaaatt aaaatgtctg ataatggacc ccaatcaaac caacgtagtg cccccccgcat   540

tacatttggt ggaccc   556

<210> 147
<211> 110
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 147
acgaacatga aaattattct cttcctgaca ttgattgtat ttacatcttg cgagctatat   60

cactatcagg agtgtgttag aggtacgact gtactactaa aagaaccttg   110

<210> 148
<211> 363
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 148
gcatttagag acgtacttgt tgttttaaat aaacgaacaa attaaaatgt ctgataatgg   60

acctcaatca agccaacgta gtgccccccg cattacattt ggtggaccca cagattcaac   120

tgacaataac cagaatggag gacgcaatgg ggcaaggcca aaacagcgcc gaccccaagg   180

tttacccaat aatactgcgt cttggttcac agctctcact cagcatggca aggaggaact   240

tagattccct cgaggccagg gcgttccaat caacaccaat agtggtccag atgaccaaat   300

tggctactac cgaagagcta cccgacgagt tcgtggtggt gacggcaaaa tgaaagagct   360

cag   363

<210> 149
<211> 294
<212> DNA
<213> Severe acute respiratory syndrome virus

<400> 149
ctatcagctg cgtgcaagat cagtttcacc aaaacttttc atcagacaag aggaggttca   60

acaagagctc tactcgccac tttttctcat tgttgctgct ctagtatttt taatactttg   120

cttcaccatt aagagaaaga cagaatgaat gagctcactt taattgactt ctatttgtgc   180

tttttagcct tctgctatt cccttgtttta ataatgctta ttatattttg gttttcactc   240

gaaatccagg atctagaaaa accttgtacc aaaggctaaa cgaacatgaa actt   294

<210>   150
<211>   504
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   150
caaactgctg catttagaga cgtacttgtt gtttaaataa acgaacaaat taaaatgtct   60

gataatggac cccaatcaaa ccaacgtagt gccccccgca ttacatttgg tggacccaca   120

gattcaactg acaataacca gaatggagga cgcaatgggg caaggccaaa acagcgccga   180

ccccaaggtt tacccaataa tactgcgtct tggttcacag ctctcactca gcatggcaag   240

gaggaactta gattccctcg aggccagggc gttccaatca acaccaatag tggtccagat   300

gaccaaattg gctactaccg aagagctacc cgacgagttc gtggtggtga cggcaaaatg   360

aaagagctca gccccagatg gtacttctat tacctaggaa ctggcccaga agcttcactt   420

ccctacggcg ctaacaaaga aggcatcgta tgggttgcaa ctgagggagc cttgaataca   480

cccaaagacc acattggcac ccgt   504

<210>   151
<211>   474
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   151
ctcgccactt tttctcattg ttgctgctct agtatttttta atactttgct tcaccattaa   60

gagaaagaca gaatgaatga gctcacttta attgacttct atttgtgctt tttagccttt   120

ctgctattcc ttgtttttaat aatgcttatt atattttggt tttcactcga aatccaggat   180

ctagaagaac cttgtaccaa agtctaaacg aacatgaaac ttctcattgt tttgacttgt   240

atttctctat gcagttgcat atgcactgta gtacagcgct gtgcatctaa taaacctcat   300

gtgcttgaag atccttgtaa ggtacaacac taggggtaat acttatagca ctgcttggct   360

ttgtgctcta ggaaaggttt tacctttttca tagatggcac actatggttc aaacatgcac   420

acctaatgtt actatcaact gtcaagatcc agctggtggt gcgcttatag ctag   474

<210>   152
<211>   516

```
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  152
cattaagaga aagacagaat gaatgagctc actttaattg acttctattt gtgcttttta      60

gcctttctgc tattccttgt tttaataatg cttattatat tttggttttc actcgaaatc     120

caggatctag aagaaccttg taccaaagtc taaacgaaca tgaaacttct cattgttttg     180

acttgtattt ctctatgcag ttgcatatgc actgtagtac agcgctgtgc atctaataaa     240

cctcatgtgc ttgaagatcc ttgtaaggta caacactagg ggtaatactt atagcactgc     300

ttggctttgt gctctaggaa aggtttacc ttttcataga tggcacacta tggttcaaac     360

atgcacacct aatgttacta tcaactgtca agatccagct ggtggtgcgc ttatagctag     420

gtgttggtac cttcatgaag gtcaccaaac tgctgcattt agagacgtac ttgttgtttt     480

aaataaacga acaaattaaa atgtctgata atggac                               516


<210>  153
<211>  451
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  153
ccaaggttta cccaataata ctgcgtcttg gttcacagct ctcactcagc atggcaagga      60

ggaacttaga ttccctcgag gccagggcgt tccaatcaac accaatagtg gtccagatga     120

ccaaattggc tactaccgaa gagctacccg acgagttcgt ggtggtgacg gcaaaatgaa     180

agagctcagc cccagatggt acttctatta cctaggaact ggcccagaag cttcacttcc     240

ctacggcgct aacaaagaag gcatcgtatg ggttgcaact gagggagcct tgaatacacc     300

caaagaccac attggcaccc gcaatcctaa taacaatgct gccaccgtgc tacaacttcc     360

tcaaggaaca acattgccaa aaggcttcta cgcagaggga agcagaggcg gcagtcaagc     420

ctcttctcgc tcctcatcac gtagtcgcgg t                                   451


<210>  154
<211>  495
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  154
gatgaagctc agcctttgcc gcagagacaa aagaagcagc ccactgtgac tcttcttcct      60

gcggctgaca tggatgattt ctccagacaa cttcaaaatt ccatgagtgg agcttctgct     120

gattcaactc aggcataaac actcatgatg accacacaag gcagatgggc tatgtaaacg     180

ttttcgcaat tccgtttacg atacatagtc tactcttgtg cagaatgaat tctcgtaact     240

aaacagcaca agtaggttta gttaacttta atctcacata gcaatcttta atcaatgtgt     300

aacattaggg aggacttgaa agagccacca cattttcatc gaggccacgc ggagtacgat     360
```

```
cgagggtaca gtgaataatg ctagggagag ctgcctatat ggaagagccc taatgtgtaa      420

aattaatttt agtagtgcta tccccatgtg attttaatag cttcttagga gaatgacaaa      480

aaaaaaaaaa aaaaa                                                       495
```

```
<210>  155
<211>  512
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  155
acaaggccaa actgtcacta agaaatctgc tgctgaggca tctaaaaagc ctcgccaaaa       60

acgtactgcc acaaaacagt acaacgtcac tcaagcattt gggagacgtg gtccagaaca      120

aacccaagga aatttcgggg accaagacct aatcagacaa ggaactgatt acaaacattg      180

gccgcaaatt gcacaatttg ctccaagtgc ctctgcattc tttggaatgt cacgcattgg      240

catggaagtc acaccttcgg gaacatggct gacttatcat ggagccatta aattggatga      300

caaagatcca caattcaaag acaacgtcat actgctgaac aagcacattg acgcatacaa      360

aacattccca ccaacagagc ctaaaaagga caaaaagaaa aagactgatg aagctcagcc      420

tttgccgcag agacaaaaga agcagcccac tgtgactctt cttcctgcgg ctgatatgga      480

tgatttctcc agacaacttc aaaattccat ga                                   512
```

```
<210>  156
<211>  442
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  156
tgtgactctt cttcctgcgg ctgatatgga tgtttctcca gacaacttca aaattccatg       60

agtggagctt ctgctgattc aactcaggca taaacactca tgatgaccac acaaggcaga      120

tgggctatgt aaacgttttc gcaattccgt ttacgataca tagtctactc ttgtgcagaa      180

tgaattctcg taactaaaca gcacaagtag gtttagttaa ctttaatctc acatagcaat      240

ctttaatcaa tgtgtaacat tagggaggac ttgaaagagc caccacattt tcatcgaggc      300

cacgcggagt acgatcgagg gtacagtgaa taatgctagg gagagctgcc tatatggaag      360

agccctaatg tgtaaaatta attttagtag tgctatcccc atgtgatttt aatagcttct      420

taggagaatg acaaaaaaaa aa                                               442
```

```
<210>  157
<211>  24
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Primer
```

<400> 157
atgaattacc aagtcaatgg ttac   24

<210> 158
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 158
gaagctattc gtcacgttcg   20

<210> 159
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 159
ctgtagaaaa tcctagctgg ag   22

<210> 160
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 160
cataaccagt cggtacagct a   21

<210> 161
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 161
ttatcacccg cgaagaagct   20

<210> 162
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 162
ctctagttgc atgacagccc tc   22

```
<210>  163
<211>  24
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Primer

<400>  163
tcgtgcgtgg attggctttg atgt                                      24


<210>  164
<211>  24
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Primer

<400>  164
gggttgggac tatcctaagt gtga                                      24


<210>  165
<211>  22
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Primer

<400>  165
taacacacaa acaccatcat ca                                        22


<210>  166
<211>  23
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Primer

<400>  166
ggttgggact atcctaagtg tga                                       23


<210>  167
<211>  24
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Primer

<400>  167
ccatcatcag atagaatcat cata                                      24


<210>  168
```

<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 168
cctctcttgt tcttgctcgc a   21

<210> 169
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 169
tatagtgagc cgccacacat g   21

<210> 170
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<220>
<221> misc_feature
<222> (12)..(12)
<223> n is a, c, g, or t

<400> 170
taacacacaa cnccatcatc a   21

<210> 171
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 171
ctaacatgct taggataatg g   21

<210> 172
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 172
gcctctcttg ttcttgctcg c   21

<210> 173
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 173
caggtaagcg taaaactcat c   21

<210> 174
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 174
tacacacctc agcgttg   17

<210> 175
<211> 16
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 175
cacgaacgtg acgaat   16

<210> 176
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 176
gccggagctc tgcagaattc   20

<210> 177
<211> 47
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 177
caggaaacag ctatgacttg catcaccact agttgtgcca ccaggtt   47

<210> 178

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<211>  46
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Primer

<400>  178
tgtaaaacga cggccagttg atgggatggg actatcctaa gtgtga                    46


<210>  179
<211>  20
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  Primer

<400>  179
gcataggcag tagttgcatc                                                 20


<210>  180
<211>  8
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  ATP Binding Domain


<220>
<221>  MISC_FEATURE
<222>  (1)..(1)
<223>  Xaa = A or G

<220>
<221>  misc_feature
<222>  (2)..(5)
<223>  Xaa can be any naturally occurring amino acid

<220>
<221>  MISC_FEATURE
<222>  (8)..(8)
<223>  Xaa = S or T

<400>  180

Xaa Xaa Xaa Xaa Xaa Gly Lys Xaa
1                   5


<210>  181
<211>  23
<212>  PRT
<213>  Severe acute respiratory syndrome virus

<400>  181

Trp Tyr Val Trp Leu Gly Phe Ile Ala Gly Leu Ile Ala Ile Val Met
1               5                   10                  15
```

Val Thr Ile Leu Leu Cys Cys
            20

<210> 182
<211> 16
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 182

Met Asp Leu Phe Met Arg Phe Phe Thr Leu Arg Ser Ile Thr Ala Gln
1   5   10   15

<210> 183
<211> 150
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 183

Met Arg Cys Trp Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu
1   5   10   15

Tyr Asp Ala Asn Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr
            20   25   30

Cys Ile Pro Tyr Asn Ser Val Thr Asp Thr Ile Val Val Thr Glu Gly
            35   40   45

Asp Gly Ile Ser Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly
    50   55   60

Tyr Ser Glu Asp Arg His Ser Gly Val Lys Asp Tyr Val Val Val His
65   70   75   80

Gly Tyr Phe Thr Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr
                85   90   95

Thr Asp Thr Gly Ile Glu Asn Ala Thr Phe Phe Ile Phe Asn Lys Leu
                100   105   110

Val Lys Asp Pro Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser
            115   120   125

Gly Val Ala Asn Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr
    130   135   140

Thr Thr Ser Val Pro Leu
145   150

<210> 184
<211> 20
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 184

Met Met Pro Thr Thr Leu Phe Ala Gly Thr His Ile Thr Met Thr Thr
1   5   10   15

Val Tyr His Ile
            20

<210> 185
<211> 42
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 185

Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn Val Ser
1   5   10   15

Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn Leu Asn
            20   25   30

Ser Ser Glu Gly Val Pro Asp Leu Leu Val
            35   40

<210> 186
<211> 39
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 186

Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
1   5   10   15

Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met
            20   25   30

Leu Leu Gln Phe Ala Tyr Ser
            35

<210> 187
<211> 100
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 187

Pro Leu Arg Gly Thr Ile Val Thr Arg Pro Leu Met Glu Ser Glu Leu
1   5   10   15

Val Ile Gly Ala Val Ile Ile Arg Gly His Leu Arg Met Ala Gly His
            20   25   30

Ser Leu Gly Arg Cys Asp Ile Lys Asp Leu Pro Lys Glu Ile Thr Val
            35   40   45

Ala Thr Ser Arg Thr Leu Ser Tyr Tyr Lys Leu Gly Ala Ser Gln Arg
    50   55   60

Val Gly Thr Asp Ser Gly Phe Ala Ala Tyr Asn Arg Tyr Arg Ile Gly
65   70   75   80

Asn Tyr Lys Leu Asn Thr Asp His Ala Gly Ser Asn Asp Asn Ile Ala
            85   90   95

Leu Leu Val Gln
            100

<210> 188
<211> 23
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 188

Phe Tyr Leu Cys Phe Leu Ala Phe Leu Leu Phe Leu Val Leu Ile Met
1   5   10   15

Leu Ile Ile Phe Trp Phe Ser
            20

<210> 189
<211> 19
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 189

Leu Leu Ile Val Leu Thr Cys Ile Ser Leu Cys Ser Cys Ile Cys Thr
1   5   10   15

Val Val Gln

<210> 190
<211> 24
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 190

Ile Cys Thr Val Val Gln Arg Cys Ala Ser Asn Lys Pro His Val Leu
                        Page 210

```
1              5              10             15
```

Glu Asp Pro Cys Lys Val Gln His
                20

<210> 191
<211> 22
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 191

Cys Ile Cys Thr Val Val Gln Arg Cys Ala Ser Asn Lys Pro His Val
1   5   10   15

Leu Glu Asp Pro Cys Lys
                20

<210> 192
<211> 22
<212> PRT
<213> Severe acute respiratory syndrome virus

<400> 192

Val Val Ala Val Ile Gln Glu Ile Gln Leu Leu Ala Ala Val Gly Glu
1   5   10   15

Ile Leu Leu Leu Glu Trp
                20

<210> 193
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Linker

<400> 193
aattcgcggc cgcgtcgac   19

<210> 194
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Linker

<400> 194
gtcgacgcgg ccgcg   15

<210> 195
<211> 19

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<212>   DNA
<213>   Artificial Sequence

<220>
<223>   Primer

<400>   195
aattcgcggc cgcgtcgac                                                19


<210>   196
<211>   19
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   Primer

<400>   196
ggcctcttcg ctattacgc                                                19


<210>   197
<211>   21
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   Primer

<400>   197
tgcaggtcga ctctagagga t                                             21


<210>   198
<211>   410
<212>   PRT
<213>   Avian infectious bronchitis virus

<400>   198
```

Met Ala Ser Gly Lys Ala Ala Gly Lys Thr Asp Ala Pro Ala Pro Val
1   5   10   15

Ile Lys Leu Gly Gly Pro Lys Pro Pro Lys Val Gly Ser Ser Gly Asn
                20   25   30

Ala Ser Trp Phe Gln Ala Ile Lys Ala Lys Lys Leu Asn Thr Pro Pro
            35   40   45

Pro Lys Phe Glu Gly Ser Gly Val Pro Asp Asn Glu Asn Ile Lys Pro
        50   55   60

Ser Gln Gln His Gly Tyr Trp Arg Arg Gln Ala Arg Phe Lys Pro Gly
65   70   75   80

Lys Gly Gly Arg Lys Pro Val Pro Asp Ala Trp Tyr Phe Tyr Tyr Thr
                85   90   95

Gly Thr Gly Pro Ala Ala Asp Leu Asn Trp Gly Asp Thr Gln Asp Gly
            100   105   110

Ile Val Trp Val Ala Ala Lys Gly Ala Asp Thr Lys Ser Arg Ser Asn
        115   120   125

Gln Gly Thr Arg Asp Pro Asp Lys Phe Asp Gln Tyr Pro Leu Arg Phe
    130   135   140

Ser Asp Gly Gly Pro Asp Gly Asn Phe Arg Trp Asp Phe Ile Pro Leu
145   150   155   160

Lys Asn Arg Gly Arg Ser Gly Arg Ser Thr Ala Ala Ser Ser Ala Ala
            165   170   175

Ala Ser Arg Ala Pro Ser Arg Glu Gly Ser Arg Gly Arg Arg Ser Asp
            180   185   190

Ser Gly Asp Asp Leu Ile Ala Arg Ala Ala Lys Ile Ile Gln Asp Gln
        195   200   205

Gln Lys Lys Gly Ser Arg Ile Thr Lys Ala Lys Ala Asp Glu Met Ala
    210   215   220

His Arg Arg Tyr Cys Lys Arg Thr Ile Pro Pro Asn Tyr Arg Val Asp
225   230   235   240

Gln Val Phe Gly Pro Arg Thr Lys Gly Lys Glu Gly Asn Phe Gly Asp
            245   250   255

Asp Lys Met Asn Glu Glu Gly Ile Lys Asp Gly Arg Val Thr Ala Met
            260   265   270

Leu Asn Leu Val Pro Ser Ser His Ala Cys Leu Phe Gly Ser Arg Val
        275   280   285

Thr Pro Lys Leu Gln Leu Asp Gly Leu His Leu Arg Phe Glu Phe Thr
    290   295   300

Thr Val Val Pro Cys Asp Asp Pro Gln Phe Asp Asn Tyr Val Lys Ile
305   310   315   320

Cys Asp Gln Cys Val Asp Gly Val Gly Thr Arg Pro Lys Asp Asp Glu
            325   330   335

Pro Lys Pro Lys Ser Arg Ser Ser Ser Arg Pro Ala Thr Arg Gly Asn

```
              340                    345                    350
```

Ser Pro Ala Pro Arg Gln Gln Arg Pro Lys Lys Glu Lys Lys Leu Lys
        355   360   365

Lys Gln Asp Asp Glu Ala Asp Lys Ala Leu Thr Ser Asp Glu Glu Arg
        370   375   380

Asn Asn Ala Gln Leu Glu Phe Tyr Asp Glu Pro Lys Val Ile Asn Trp
385   390   395   400

Gly Asp Ala Ala Leu Gly Glu Asn Glu Leu
                405   410

```
<210>   199
<211>   30
<212>   PRT
<213>   conotoxin

<400>   199
```

Cys Ile Ala Val Gly Gln Leu Cys Val Phe Trp Asn Ile Gly Arg Pro
1   5   10   15

Cys Cys Ser Gly Leu Cys Val Phe Ala Cys Thr Val Lys Leu
            20   25   30

```
<210>   200
<211>   31
<212>   PRT
<213>   Severe acute respiratory syndrome virus

<400>   200
```

Cys Ile Ser Leu Cys Ser Cys Ile Cys Thr Val Val Gln Arg Cys Ala
1   5   10   15

Ser Asn Lys Pro His Val Leu Glu Asp Pro Cys Lys Val Gln His
            20   25   30

```
<210>   201
<211>   310
<212>   DNA
<213>   Severe acute respiratory syndrome virus

<400>   201
cgatgtttca tcttgttgac ttccaggtta caatagcaga gatattgatt atcattatga     60

ggactttcag gattgctatt tggaatcttg acgttataat aagttcaata gtgagacaat    120

tatttaagcc tctaactaag aagaattatt cggagttaga tgatgaagaa cctatggagt    180

tagattatcc ataaaacgaa catgaaaatt attctcttcc tgacattgat tgtatttaca    240
```

```
tcttgcgagc tatatcacta tcaggagtgt gttagaggta cgactgtact actaaaagaa    300

ccttgcccat                                                          310
```

```
<210>  202
<211>  556
<212>  DNA
<213>  Severe acute respiratory syndrome virus

<400>  202
agaaagacag aatgaatgag ctcactttaa ttgacttcta tttgtgcttt ttagcctttc     60

tgctattcct tgttttaata atgcttatta tattttggtt ttcactcgaa atccaggatc    120

tagaagaacc ttgtaccaaa gtctaaacga acatgaaact tctcattgtt ttgacttgta    180

tttctctatg cagttgcata tgcactgtag tacagcgctg tgcatctaat aaacctcatg    240

tgcttgaaga tccttgtaag gtacaacact aggggtaata cttatagcac tgcttggctt    300

tgtgctctag gaaaggtttt accttttcat agatggcaca ctatggttca aacatgcaca    360

cctaatgtta ctatcaactg tcaagatcca gctggtggtg cgcttatagc taggtgttgg    420

taccttcatg aaggtcacca aactgctgca tttagagacg tacttgttgt tttaaataaa    480

cgaacaaatt aaaatgtctg ataatggacc ccaatcaaac caacgtagtg ccccccgcat    540

tacatttggt ggaccc                                                   556
```

```
<210>  203
<211>  1255
<212>  PRT
<213>  Severe acute respiratory syndrome virus

<400>  203

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu
1               5                  10                  15


Asp Arg Cys Thr Thr Phe Asp Asp Val Gln Ala Pro Asn Tyr Thr Gln
            20                  25                  30


His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg
        35                  40                  45


Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser
    50                  55                  60


Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Gly Asn Pro Val
65                  70                  75                  80


Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn
                85                  90                  95
```

Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln
        100   105   Met   110

Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Cys
        115   120   125

Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met
    130   135   140

Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr
145   150   155   160

Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val Ser Glu Lys Ser
            165   170   175

Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly
        180   185   190

Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp
        195   200   205

Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu
    210   215   220

Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Ser Pro
225   230   235   240

Ala Gln Asp Ile Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
            245   250   255

Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
        260   265   270

Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
    275   280   285

Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
    290   295   300

Phe Arg Val Val Pro Ser Gly Asp Val Val Arg Phe Pro Asn Ile Thr
305   310   315   320

Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser
            325   330   335

Val Tyr Ala Trp Glu Arg Lys Lys Ile Ser Asn Cys Val Ala Asp Tyr
        340   345   350

Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly
     355   360   365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala
     370   375   380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly
385   390   395   400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe
          405   410   415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser
          420   425   430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu
          435   440   445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly
     450   455   460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp
465   470   475   480

Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val
          485   490   495

Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly
          500   505   510

Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn
     515   520   525

Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg
     530   535   540

Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp
545   550   555   560

Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys
          565   570   575

Ala Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser
          580   585   590

Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr
     595   600   605

```
Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr
    610             615             620

Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu
625             630             635             640

His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly Ala Gly Ile
                645             650             655

Cys Ala Ser Tyr His Thr Val Ser Leu Leu Arg Ser Thr Ser Gln Lys
            660             665             670

Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Asp Ser Ser Ile Ala
            675             680             685

Tyr Ser Asn Asn Thr Ile Ala Ile Pro Thr Asn Phe Ser Ile Ser Ile
    690             695             700

Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ser Val Asp Cys
705             710             715             720

Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu
                725             730             735

Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile
            740             745             750

Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys
        755             760             765

Gln Met Tyr Lys Thr Pro Thr Leu Lys Tyr Phe Gly Gly Phe Asn Phe
    770             775             780

Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile
785             790             795             800

Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met
            805             810             815

Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile
            820             825             830

Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr
            835             840             845

Asp Asp Met Ile Ala Ala Tyr Thr Ala Ala Leu Val Ser Gly Thr Ala
```

850   855   860

Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln Ile Pro Phe
865   870   875   880

Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn
                885   890   895

Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala
            900   905   910

Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly
            915   920   925

Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu
    930   935   940

Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn
945   950   955   960

Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp
            965   970   975

Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr Val Thr Gln
            980   985   990

Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn Leu Ala Ala
    995   1000   1005

Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg Val Asp
    1010   1015   1020

Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln Ala Ala
    1025   1030   1035

Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln
    1040   1045   1050

Glu Arg Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu Gly Lys
    1055   1060   1065

Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser
    1070   1075   1080

Trp Phe Ile Thr Gln Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr
    1085   1090   1095

```
Thr Asp  Asn Thr Phe Val Ser  Gly Asn Cys Asp Val  Val Ile Gly
    1100                 1105                 1110

Ile Ile  Asn Asn Thr Val Tyr  Asp Pro Leu Gln Pro  Glu Leu Asp
    1115                 1120                 1125

Ser Phe  Lys Glu Glu Leu Asp  Lys Tyr Phe Lys Asn  His Thr Ser
    1130                 1135                 1140

Pro Asp  Val Asp Leu Gly Asp  Ile Ser Gly Ile Asn  Ala Ser Val
    1145                 1150                 1155

Val Asn  Ile Gln Lys Glu Ile  Asp Arg Leu Asn Glu  Val Ala Lys
    1160                 1165                 1170

Asn Leu  Asn Glu Ser Leu Ile  Asp Leu Gln Glu Leu  Gly Lys Tyr
    1175                 1180                 1185

Glu Gln  Tyr Ile Lys Trp Pro  Trp Tyr Val Trp Leu  Gly Phe Ile
    1190                 1195                 1200

Ala Gly  Leu Ile Ala Ile Val  Met Val Thr Ile Leu  Leu Cys Cys
    1205                 1210                 1215

Met Thr  Ser Cys Cys Ser Cys  Leu Lys Gly Ala Cys  Ser Cys Gly
    1220                 1225                 1230

Ser Cys  Cys Lys Phe Asp Glu  Asp Asp Ser Glu Pro  Val Leu Lys
    1235                 1240                 1245

Gly Val  Lys Leu His Tyr Thr
    1250                 1255
```

```
<210>  204
<211>  422
<212>  PRT
<213>  Severe acute respiratory syndrome virus

<400>  204

Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro Arg Ile
1             5                 10                15

Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn Gly Gly
          20                25                30

Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu Pro Asn
      35                40                45
```

```
Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu
    50              55              60

Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly
65              70              75              80

Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg
            85              90              95

Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr
            100             105             110

Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala Asn Lys
        115             120             125

Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr Pro Lys
    130             135             140

Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr Val Leu
145             150             155             160

Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala Glu Gly
            165             170             175

Ser Arg Gly Gly Ser Gln Ala Ser Ser Arg Ser Ser Ser Arg Ser Arg
            180             185             190

Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn Ser Pro
        195             200             205

Ala Arg Met Ala Ser Gly Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu
    210             215             220

Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln
225             230             235             240

Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser
            245             250             255

Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr
            260             265             270

Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly
        275             280             285

Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln
    290             295             300
```

```
Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg
305               310             315                 320


Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr His Gly
                325             330                 335


Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn Val Ile
            340             345             350


Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu
        355             360             365


Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro
    370             375             380


Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp
385             390             395                 400


Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly Ala Ser
            405             410             415


Ala Asp Ser Thr Gln Ala
            420
```

```
<210>  205
<211>  221
<212>  PRT
<213>  Sars associated coronavirus

<400>  205
```

```
Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
1               5               10                  15


Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met
            20              25              30


Leu Leu Gln Phe Ala Tyr Ser Asn Arg Asn Arg Phe Leu Tyr Ile Ile
        35              40              45


Lys Leu Val Phe Leu Trp Leu Leu Trp Pro Val Thr Leu Ala Cys Phe
    50              55              60


Val Leu Ala Ala Val Tyr Arg Ile Asn Trp Val Thr Gly Gly Ile Ala
65              70              75                  80


Ile Ala Met Ala Cys Ile Val Gly Leu Met Trp Leu Ser Tyr Phe Val
            85              90              95
```

```
Ala Ser Phe Arg Leu Phe Ala Arg Thr Arg Ser Met Trp Ser Phe Asn
            100                 105                 110

Pro Glu Thr Asn Ile Leu Leu Asn Val Pro Leu Arg Gly Thr Ile Val
            115                 120                 125

Thr Arg Pro Leu Met Glu Ser Glu Leu Val Ile Gly Ala Val Ile Ile
            130                 135                 140

Arg Gly His Leu Arg Met Ala Gly His Ser Leu Gly Arg Cys Asp Ile
145                 150                 155                 160

Lys Asp Leu Pro Lys Glu Ile Thr Val Ala Thr Ser Arg Thr Leu Ser
                165                 170                 175

Tyr Tyr Lys Leu Gly Ala Ser Gln Arg Val Gly Thr Asp Ser Gly Phe
                180                 185                 190

Ala Ala Tyr Asn Arg Tyr Arg Ile Gly Asn Tyr Lys Leu Asn Thr Asp
                195                 200                 205

His Ala Gly Ser Asn Asp Asn Ile Ala Leu Leu Val Gln
        210                 215                 220
```

```
<210>  206
<211>  76
<212>  PRT
<213>  Severe acute respiratory syndrome virus

<400>  206
```

```
Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser
1                 5                   10                  15

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
                20                  25                  30

Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn
            35                  40                  45

Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn
        50                  55                  60

Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val
65                  70                  75
```